Supplement to The Photographic News

Clark

sculpsit

DEDHAM BRIDGE

THE

# PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

# PROGRESS OF PHOTOGRAPHY.

VOLUME XXXV.

EDITED BY T. C. HEPWORTH, F.C.S.

*Nulla recordanti lux est ingrata.*—MARTIAL.

LONDON:
PRINTED AND PUBLISHED BY PIPER & CARTER, 5, FURNIVAL STREET.

1891.

# INDEX.

THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1687.—*January* 2, 1891.



CONTENTS.

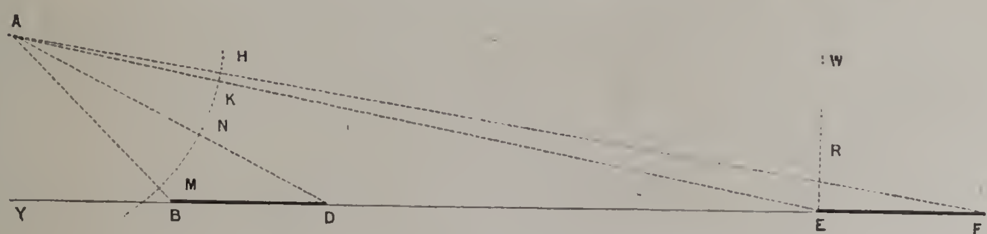


## SAFE DEVELOPMENT IN GOOD LIGHT.

In the Photographic News Year-Book just issued, we gave full details in relation to the principles governing developing room illumination, and how to make a lamp which will give a practically uniform light from one year's end to another, so that one element of uncertainty in developing is removed, and whatever may occur with the plates, the operator never has occasion to doubt the constancy of his light. Another and greater advantage of the plan is that, under a scientific system of developing room illumination, the photographer has the power of working in the maximum amount of coloured light which any particular brand of plates will bear, greatly to his comfort day by day, and to the benefit of his eyesight after the lapse of years.

Another step towards the abolition of empiricism in developing operations is to make proper use of the uniformly steady and trustworthy coloured glow when it is employed. Acquaintance with a few leading principles in this matter will enable a photographer to develop his plates safely in the same light in which another photographer using the same plates might get pronounced fog.

Fig. 1 helps to explain two principles, namely, the influence of the distance of the horizontal plate in the developing dish from the source of light, and the influence of keeping the plate as much as possible in a horizontal rather than a vertical position during developing operations. Let YF be a table six feet long, and A the source of light; with transparent coloured glass in the lantern, A is the flame itself; with a translucent coloured screen, it is a point on the surface of that screen, such screens becoming themselves, for argumentative purposes, virtually the source of




light. A photographic plate, BD, a foot square, is represented with its edge B at a distance of one foot from the point Y, which is directly below the luminous point A, and EF is another plate a foot square, with its edge E five feet from Y. The diagram shows that the latter plate has far less light acting upon it than has the first one; the plate EF receives only the cone of rays represented by the angle AKH, whilst BD receives the cone of rays included by the angle AMN. Rapid plates, which would fog, say, if developed in the position BD, might, perhaps, be developed with absolute safety at EF, at the end of the table. With the same source of light, it might be unwise to develop slow landscape plates in the dim illumination at EF, when they might bear the brighter illumination of the position BD. By far the best way to develop plates of different rapidities with safety is to suitably vary the distance of the developing dish from the source of light, and not to alter the light itself.

Whether the plate, in handling, be held much in a vertical or in a horizontal position, has an influence upon the amount of light it receives, consequently upon its tendency to get fogged. For instance, tilt the horizontal plate EF into the vertical position EW; the diagram, by the additional length RW, shows that it then receives about four times more light.

The powerful influence of developing at different distances from the lamp may be illustrated by fig. 2, a cut which we used for another purpose in the Year-Book, and which cut is reproduced from the standard work on "Chemistry," written by the late Professor W. Allen Miller. Let the candle in this cut represent the source of light, and 2 represent a sensitive plate one foot square, placed at two feet from the flame; now move the vertical plate to a distance of six feet, and it will be seen that it receives one-ninth the previous amount of light, so that the chance of fogging is greatly reduced by working with the plate at that distance.

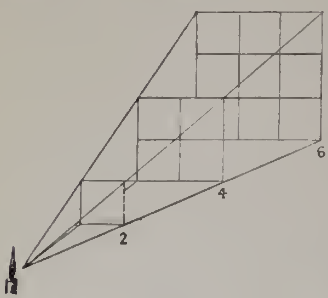


*Fig.* 2.

By careful attention to such principles as these, it is possible to develop plates without fog, by the aid of a naked candle, without any dark room lamp at all, a plan which, if our memory be not at fault, was first published by Captain Abney; at all events, we read it somewhere, and have on rare occasions employed the method in the bedrooms of mountain hotels, with the actual plates of the late Dr. Van Monckhoven, which were slow. The plan is to put a candle down on the floor in one corner of a large bedroom, and to hang a towel over a clothes-horse placed immediately in front of the light; then go to the farther corner of the bedroom, and with the back to the lighted corner, and the developing dish immediately in front of the body, take out the plate, and pour on the developing solution, preferably a yellow one or one which quickly turns yellow. This will bring out the image, and by care not to infringe various principles herein laid down, an unfogged image can be brought out, and then washed and fixed. In this instance the candle illuminates its own corner of the room and the ceiling close to that corner, whence some is reflected to the opposite corner, but not to the plate, because of the interposition of the body of the operator; next some of the residual light is reflected to the developing dish.

In telegraphy certain excellent instruments cannot be used, because their working needs intelligent knowledge of electricity on the part of the operator, who is thus made virtually a part of the apparatus; such a worker, however, can command more salary, hence it in some cases is more profitable to use an inferior machine, worked by a less educated man, such, perhaps, as a railway policeman, who is usually helpless directly the instrument gets out of order; he cannot put it right. So is it in developing. The brightest light can only be used constantly with safety when the intelligence of the operator virtually forms a part of the developing room lantern.

Another influence should be borne in mind in developing room work. The plate is much safer than before when covered by the developer, even when the developer itself is colourless, for the surface of liquid reflects a portion of the light which falls upon it, and that reflected light cannot reach the plate. Of every 100 rays of light falling at an angle of 50 degrees, water reflects 72, glass 54, marble 60, mercury and speculum metal 70. Dark coloured substances reflect little light. At a small or grazing angle, much light is reflected, so much so that even a sheet of white paper can be made to act as a mirror. If a sheet of white paper be held horizontally between the eye and a candle-flame, and almost at the level of the eye, the observer will see an image of the flame reflected by the paper.

When the total effect of all the influences mentioned is considered, it becomes evident what a vast gain in safety there is by developing at the position EF, fig. 1, instead of at the position BD.

That any plate should be developed at one particular distance from the lantern to get the best results with the maximum of light, is neither necessary nor desirable. The operator can have illumination enough to comfortably take a very sensitive plate out of the slide at a distance of six or ten feet from the lantern, to put it in the developing dish, and to cover it with the solution, after which, in accordance with the principles just enunciated, it will bear moving much nearer to a bright yellow light than would otherwise have been the case. As development goes on, it will bear bringing still nearer to a bright light, and towards the close —in those instances in which the plate has been underexposed—it is actually advantageous to open the coloured window of the lantern, and to allow the white light from the flame to shine upon the plate in the developer. This may produce a slight veil, but it will bring up some detail which otherwise would have been lost, as Mr. Cowan has recently proved by sensitometer experiments, and in practical photography it is scarcely possible to have a safer guide than Mr. Alexander Cowan, who is the manager of the works of Messrs. Marion and Co. at Southgate. It is well for a photographer to get into the regular habit of taking the plate out of the slide, and covering it with the developer at a good distance from the lantern.

As to the advantages set forth in the last Year-Book, of yellow over red light in the developing room, when orthochromatic plates are not employed, Mr. Debenham deserves the thanks of photographers for his letter in another column for the correction of an historical error as to the date and origin of the first publication of the explanation of the cardinal mistake about the proper colour of the light to use with gelatine plates, which had previously existed in all text-books. We were not aware of the existence of that paragraph when drawing attention to an article from another source, in which diagrammatic and tabular evidence was given of the truth of the principle enunciated. Since then, more accurate measurements than Fraunhöfer's of the relative luminous intensities of the different parts of the spectrum have become available; for instance, the following more modern table on the subject has been published in Amédée Guillemin's "Forces of Nature," translated from the French by Mrs. Norman Lockyer:

| Colours. | Luminous Intensities. | Lines |
|---|---|---|
| Extreme Red ... | ... Imperceptible ... | ... A |
| Red ... | 32 | ... B |
| Red ... | 94 | ... C |
| Orange | 640 | ... D |
| Yellow | 1,000 | ... |
| Green ... | 480 | ... E |
| Blue ... | 170 | ... F |
| Indigo... | 31 | ... G |
| Extreme Violet | 6 | ... H |

This table shows the relative luminosity of the spectrum where cut by the eight principal lines of Fraunhöfer. The maximum brightness is between D and E, nearer D, and distant from it about one-tenth of the total interval DE. Thus the eye, according to Guillemin, is more than ten times more sensitive to yellow than to red light, and this physiological peculiarity of the eye, which of course is not represented in spectrum photographs, has to be considered when selecting the best light for developing room operations with plates which are not orthochromatic.

This matter is a serious one for professional photographers, because of the injury to eyesight brought about by constant work in the red light of the developing room. Mr. William Ackland, an experienced oculist, stated at a meeting of the Photographic Society, held November 30th, 1883, that he had noticed that a larger proportion of photographers than other people had found it necessary to have the glasses of their spectacles changed for others of higher power; he attributed the circumstance to the general use of red light in the developing room. Mr. Valentine Blanchard attributed a weakening of his eyesight to the red light, and Mr. J. J. Briginshaw once stated that, by substituting yellow for red light, his eyes had found great relief, and that, by the former light, he could work a longer time in the developing room, with less inconvenience, than when he operated therein for a shorter time by red light.

## SUPPLEMENT TO THE PHOTOGRAPHIC NEWS.

To-day is issued, as a supplement to the Photographic News, a photogravure print from Mr. Lyonel Clark's photograph of Dedham Bridge, which won a medal at the last exhibition of the Photographic Society. Mr. Clark is an energetic member of the Camera Club, and the son of Mr. Latimer Clark, the well-known electrician, who has been connected with submarine and other telegraphy from the earliest times.

Lantern Plates.—Messrs. B. J. Edwards and Co. have sent us some specimen gelatino-chloride lantern plates, accompanied by a ready-prepared iron developing solution. We found them to give nice, warm brown tones, and to work in a clean manner, without veil. The magnesium light was used for printing by contact. Messrs. Edwards and Co. also enclosed some gelatino-bromide lantern plates; they were found to work well in the copying camera, also in contact printing. The quinol developer which the firm recommends gave clear, black images; the pyrogallol developer it recommends we found to give rather warmer tones.

## THE PHOTOGRAPHIC REPRODUCTION OF LITERARY MATTER.

Many tastily executed volumes owe their principal adornments either directly or indirectly to photography, which art is as useful a handmaid to book-writing as it is to many other branches of art. And a few books depend altogether upon photographic processes for their existence. As a case in point, we may mention the excellent reproduction of John Burnet's art essays, which was issued by an American publisher a short time ago. In this case it was, of course, imperative that the illustrations should be exact copies of the originals, or they would have been valueless; and it was, no doubt, cheaper to reproduce the printed matter in the same way than to set up the type anew. The ease with which type can be reproduced by photography was also instanced a year or two back, on the completion of the last edition of the *Encyclopædia Britannica*. Hardly had the last volume been issued before an American publisher, with that utter disregard for copyright which is a characteristic of the class, announced the whole work for sale at a greatly reduced price. The volumes had been copied page by page by means of the camera, and reproduced in block form by the zinc etching process.

But where photography is seen at its best in book work is in the reproduction of old black letter type, or in manuscript volumes. One of these latter now lies before us, and a very remarkable volume it is. The original is in various handwritings, for the book was contributed to by different persons who lived in the sixteenth, seventeenth, and eighteenth centuries. The work—which is entitled, "Arcana Fairfaxiana, or ye Apothecarie, his booke," in *fac simile*—is a literary curiosity of great interest, particularly to those who, like photographers, have anything to do with matters chemical.

The history of this reprint is curious. During alterations of some business premises in Pilgrim Street, Newcastle-on-Tyne, which had been in the occupation of a firm of chemists for more than a hundred years, a number of books was turned out from a lumber room, and among them was one that attracted the attention of Mr. George Weddell. With infinite care, this gentleman examined the volume and found it to consist of a number of domestic and medical recipes written in different handwritings. By the exercise of unusual sagacity, he succeeded in tracing the work to the Fairfax family, hence the title which he has conferred upon it. Several of the leaves were so discoloured that it was almost impossible to reproduce them by photography, so they were traced and transferred to stone; but, where possible, photography has been employed, so that we have before us the identical handwriting of those who, some of them, "went down into silence" three hundred years ago. The book is not only most interesting as containing specimens of the different styles of writing which prevailed at various periods, but is a delightful peep into the domestic economy and medical superstitions of a bygone age. In some cases the M.S. is not readily decipherable, not through any fault in reproduction, which is excellent throughout, but more on account of archaic abbreviations and old-fashioned modes of writing particular letters which are strange to the modern eye. But, taking the MS. as a whole, we may say that we frequently receive letters from worthy correspondents who do not write half so plainly as some of the persons who contributed to this volume. But, although the caligraphy leaves little to be desired, we should not recommend our correspondents to copy the method adopted in this volume for writing formulæ; for there is a little too much of the careless, go-as-you-please, rule-of-thumb business about them. For instance, a formula for development would not be of much use if written in the following vague manner:—

"To Make Puffe Paste.

"Take a quantety of fine flower, 4 whits of Eggs, a little rose water or other cold water; mold your paste together, and beat it with your rollin-pin, for ye stiffer yu make it, ye better."

Here, again, is a curious relic of the superstitious medical knowledge of a long past period, an attempt at diagnosis which was no doubt, at one time, commonly put into practice.

"How to Know ye K[ing's] Evill.

"Take a ground worme alive and lay him upon ye swelling or sore and cover him with a leafe. Yf it be ye disease, ye worme will change, and turn into earth. Yf it be not, he will remain whole and sound."

This comical idea that a worm would not only turn, but would actually turn into earth, probably had its origin in the observation of worm-casts on the grass, which, taking so closely the form of the creature which made them, might give rise to the suggestion of actual transformation. But earth worms were apparently a favourite remedy for different complaints, for in this book they form one of the component parts in various mixtures of extreme nastiness. For example, there is a remedy "for ache, stitch, or swelling," which begins thus:—

"Take half a peck of earth-worms and putt them into hay to skowre themselves."

The unfortunate worms, after sufficient scouring in the hay, are stamped small—and the effect of stamping small half a peck of earth-worms is a thing which the imagination does not care to dwell upon—and are then transferred to a quantity of wine, and the mixture is boiled until it is evaporated down to one half. The redeeming point in this precious concoction is that it is intended for external application only. But there aro nastier remedies in this book which our forefathers used to sip, if not with relish, with the firm conviction that good would accrue; and there is little doubt that in many cases their hopes would be realised, for faith in a remedy is half tho battle, as every doctor knows. We must congratulate Mr. Weddell iu giving us a literary treat which is of interest from so many points of view.

## NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. 1.

Of all the applications to which many branches of art have been put, that of portraiture is the most ancient, the most universal, and always has been the most popular. Indeed, it may be justly said that for portraiture art was invented. The persistence of its types is wonderful. According to tradition it began with a silhouette, and the same simple art is being revived by American photographers.

What was the origin of portraiture? The time-worn tradition tells us that its simple rudiments were due to the Greek maiden who traced the outlines of the shadow of her lover on the wall, that she might be reminded of him when he had gone to the wars—a pretty myth that ought to be true. This is said to have happened about 800 B.C.; yet this must have been a late date in the history of art, for Aristotle ascribes the invention to Euchir, who flourished about 400 years earlier. Other authors give the honour to other names, but all agree that its first appearance was among the Greeks, and that the earlier portraits represented the bare shadow, which was produced by circumscribing the figure with a single line only, and was the art they called *Sciagraphia*. Afterwards shading was added to give the appearance of roundness, but, as a quaint old writer puts it, "The advantages it brought to its inventors were so inconsiderable that they still found it necessary to write under every individual piece the name of whatever it was designed to represent, lest otherwise the spectators should never be able of themselves to make the discovery."

The date I have mentioned as the time of the beginning of art, a little over three thousand years ago, seems a far-off time, yet art, and probably portraiture, was practised, it is calculated, quite two hundred thousand years earlier. We have direct evidence of the portraiture of pre-historic man in the outlines of extinct animals engraved on mammoth ivory, and discovered in the drift.

We will skip a few thousand years, and come down to comparatively modern times.

Portraiture has always been the chief purpose of art, at least numerically. In England scarcely any other form of pictorial art was practised until the last century, if we exclude the art of miniature painting, of which we have such splendid examples in Missals and similar books. The English school can boast of the two greatest portraitists that ever lived, Holbein in the reign of Henry VIII., and Van Dyck in the time of Charles I. During the seventeenth and eighteenth centuries the number of portrait painters must have been enormous, yet the names of very few of them have come down to us. We can scarcely go into an old country house without finding a collection of portraits, usually all very bad, and so much alike according to date that you would suppose they represented the ideal of the painter rather than the individual. The conventionality of pose was, it is said, once carried to such an extent that when, in the time of heavy perukes, it was the fashion to carry the hat under the arm, if a sitter insisted on being represented with his hat on his head, he was painted with *two* hats, one on his head, the other under the arm: the painter would not give up his favourite pose. I have, however, never met with one of these double-hatted portraits. These family portraits are generally nameless as regards the painter, and, indeed, often doubtful as to the name of the person. There must have been a great number of itinerant portraitists going about the country in those days.

I happen to know one or two of these old country mansions or halls. As is often the case in these days of agricultural depression, the occupiers are not the owners, and take their ancestors on lease with the house and furniture, which is, perhaps, better than buying them in Wardour Street. It affords more variety; you can get a fresh set of ancestors every time you change house. In the one I have now in my mind's eye the portraits are very good, beginning with the dark and sensual face of Charles II., who visited the place. There are many Lely's and Kneller's (what immense portrait manufactories these popular painters must have had), after which, as usual, they become anonymous. There is the usual handsome captain, time of Queen Anne, attitudinising before the spectator; the dean in gown and bands, without whom no gentleman's family could be complete; the county squire; and the co-heiress twins.

In another house the portraits are nearly all of the last century, as though the family began and ended in that period. This, however, is not the case, for there are still successors in existence. Can it be that the portraiture of the first half of the present century was too bad to encourage or to keep? There were a few good portraitists, as we all know, seventy or eighty years ago—the successors of Gainsborough and Reynolds; but from examples one sometimes meets with, the ordinary oil portrait must have been very bad. We are told that when things come to their worst they mend. It is a fact that middle-class portraiture of the time was sometimes so bad that ordinary people, who could not afford to employ the fashionable painters, Lawrence, Raeburn, Romney, Opie, or Shee, had, in despair, to have recourse to the humble silhouette. The popularity of this precursor of the photographic portrait for many years was marvellous. It was to be found in every home, both high and low, just as the photograph is now, but not, of course, to so great an extent. They began to be popular in the early years of the last century, and lasted up to the introduction of photography, and were never more popular than between 1830 and 1850. It is darkest before the dawn. I believe it would be now still easier to find a silhouetter than a Daguerreotypist.

It is a curious satire on fads, crazes, and fashions in art that even these black sticking-plaster portraits have been held up, if not as the highest art, as preferable to the work of the legitimate portrait painter, just as the "impression" of the present-time naturalistic is preached up by some latter-day enthusiasts as being superior to great art.

In 1780, a German follower of Lavater, as quoted by Mr. Tuer in the *English Illustrated Magazine*, wrote a volume in which he claimed the shadow portrait as a specimen of true art when compared with the "daub of the day" (the day of Reynolds, of Romney, and of Raeburn!) "This art," he says, "is older than any other. In Arcadia itself silhouettes were drawn. The shepherds of that golden age, in their happy simplicity, traced shadows of their beloved on the sand—to worship in absence. From silhouettes came cartoons, then monochrome, and, finally, painting. The most perfect in the order of things displaces the less perfect. But now, again, since this new culture of physiognomy, silhouettes are asked for, since these give a truer idea than the daubs of the ignorant. The taste of man has revolted against affectation and returned to the simple." Silhouettes gave rise to the invention of the profile machine, a rod working on a pivot or universal joint. The long arm was passed over the profile while the pencil in the short arm marked the likeness. Photographers are not, then, the first to take portraits by machinery, and the profile-machinists were patronized by Royalty—or said they were—like some photographers.

We are in the habit of considering and talking of the enormous number of photographic portraits produced each year, and photographers have a right to boast of their output, if not of their quality; but the portrait painters, also, must have been most productive, in some cases, indeed, beyond belief.

Michael Jansen Mirevelt, a contemporary of Rembrandt, is credited with having painted the largest number of portraits. Besides a number of altar-pieces, he is estimated by Descamps to have painted 10,000 portraits; this prodigious number is, however, limited by Houbraken to 5,000. Taking the lesser number, and giving him forty years' work, he must have averaged over two heads a day, which, as Euclid says, is absurd. As he seldom painted a portrait of a less size than 30 by 20, his hands must have been full. Lely and Kneller had wholesale businesses, but the great painters of the latter half of the last century—Reynolds and Gainsborough—numerous as their productions appear to us, could have counted their pictures by hundreds only.

I remember several itinerant painters who visited country towns before the advent of photography—or, rather, before it became available for portraiture. They usually began by taking a portrait of the beadle in his gorgeous livery; everybody knew the beadle, and this was a capital advertisement, which never failed to bring in sitters. Photography has altered all that. The itinerant has vanished, and English portrait painting has resumed its former glories. Who shall say that this revival is not due, in some measure, to the impetus given by our more humble art?

## SOME OF THE TENDENCIES IN PHOTOGRAPHIC ART.*

BY PHILIP H. NEWMAN.

Now it may be asked, why is it, then, that rough papers are used? Surely the photographers know something of this rule of scale, if amateurs do not! They, many of them, do know, but they are on the horns of a dilemma, and this is the real crux of the matter. Much as the old albumen silver print is despised, none of the new processes of printing quite supply its place in range of tones; the reason being that lack of transparency in platinum and bromide papers, and, necessarily, incident in all matt surfaces. Photographers, feeling this, have endeavoured to mitigate the evil by breaking up their printing surfaces, and letting light into them by using rough papers, and that regardless of the scale which I have pointed out. We are all charmed by a chalk or charcoal drawing, because of this transparency in the shadows given equally by diagonal lines as by roughness of surface, and it is, of course, wished to realise this charm in photography if possible. Since the introduction of the carbon process especially, photographers have been further stimulated by the reproduction of drawings, etchings, and engravings,

* Concluded from p. 1003, vol. xxxiv.

and they wish to obtain similar artistic results directly from nature. We must, however, be content to wait for this until a satisfactory process is invented, for it must be allowed, I think, we have not quite got it yet. Another reason for our anxiety shows a little human weakness. We are disgusted when we hear that paralysing phrase, "a mere photograph!" Let us admit at once that this is weakness. Should we not rather be proud of our mere photographs? Is not the exhibition, after all, but an exhibition of mere photographs? At least no exhibit can be the grander by affecting to imitate some other form of art; the art of making a photograph is none the higher for making it imitate a second-rate sepia drawing.

But there are other photographs at the exhibition which are calling loudly for our attention.—Van der Weyde's capital Japanese costume group, Mr. Sawyer's artistic effects on the Tyne, and the excellent works of Mr. Gale and Mr. Edgar Lee. Mr. F. H. Evans gives some excellent and well-chosen pictures from Canterbury Cathedral. No one who has not photographed in a cathedral knows quite what it means. The temper and patience necessary in keeping the authorities—from Dean to verger—in good humour during the long exposures in the dark interior, is a diplomatic exercise of no mean order. Vergers particularly have a rabid, if pious, horror of a tripod stand. Visitors to the cathedral also get in front of the camera, and, although they do not always spoil a long exposure, cause considerable nervous anxiety to the photographer. Mr. Evans told me how long he had to expose a rapid plate in the crypt of Gloucester. I will not hazard a recollection, however, in case I might exaggerate. It is pleasant to note that in photographing architectural objects, the custom of placing the camera directly in front, so as to get a symmetrical picture, is giving way to a more artistic insight, and, consequently, a more desirable result. In mentioning the very artistic results observable in landscape by Mr. Sawyer and others, it should be noticed that these are obtained apparently by perfectly legitimate means. A selection of time and subject, atmospheric effect occurs in its proper place and planes, the choice of the stops used has been judicious, and no sacrifice of sharpness—or, rather, clear definition—is made unnecessarily. That there should be perfectly successful work in landscape, with atmospheric effect, and aerial perspective in the receding planes, at the same time that an agreeable and reasonable amount of definition is given in the foreground, is in itself an emphatic protest against a school of photographers who endeavour to persuade us that an inartistic subject may be rendered acceptable by fuzziness, and by the artists deliberately stultifying themselves in the use of the lens—I mean in putting the subject entirely out of focus. It is, of course, a pity that such a false view of art should obtain at all in the face of the customs and traditions of past centuries, but that men whose tastes and abilities have been shown to be superior to many of their compeers should be induced to stoop to such trifling devices is almost incredible, and greatly to be deplored, in the interest of that art they might do so much to advance.

I revert now to the subject of lantern exhibits on the screen, a custom on Monday evenings at Pall Mall, and which will be more honoured in the breach than in the observance if some judicious, not to say ruthless, weeding-out does not take place, both in the interest of art and the patience of the visitors. Moreover, to say nothing of artistic proclivities, I look upon it as a downright absurdity to continually exhibit such monstrous pictures. It is bad enough in Pall Mall, but it is worse in some places, where one is made to look upon—say, a man and woman—a pair of lovers perhaps ten feet high on a donkey fourteen feet long. I cannot admit I enjoy this sort of thing, or find the sentiment of the subject magnified proportionately. I have never seen an artistic lantern slide yet that would bear enlarging beyond eight feet diameter, and would not have been better much less. Perhaps I feel this the more that I have a weakness for lantern slides. Some people think that it is inartistic; on the contrary, it is because there is a chance of their being artistic that I like them. At the exhibition in Pall Mall they show some very good ones (especially on the Field Club nights), but I have also seen some execrably bad ones, and it is for that reason I suggest judicious weeding. It, no doubt, interests some amateurs to photograph an ugly building from every conceivable point of view, and perhaps they may take a diabolical pleasure in presenting them successively on the screen, but no purpose is served by it in the interests of art, or of the spectators. Mr. Pecksniff had many diverse views in his office of Salisbury Cathedral, but then it was Salisbury Cathedral.

There are many figure compositions in the exhibition that call for notice. Some of these are medalled, I presume for some technical excellence that is beyond my ken, as, in an artistic sense, I fail to see their merits. They certainly often show a striving and effort to obtain an artistic result, but this very want of spontaneity is fatal to the success of this ambitious class of work. It would take too long to examine all these individually, and a mere catalogue would serve no useful purpose; doubtless, however, many of these photographs live in your recollection, especially those that obtained an award. Some works in the exhibition that are not medalled are very excellent indeed. Some of these—notably one silver print—can only have been passed over, I should say, because it was a silver print. If I remember rightly, it was a group of children on a cliff, treated with great delicacy and force, and called "Idle Hours," by Mr. Robert Slingsby. When I look back to the old collodion days, and remember under what difficulties excellent work was done in all parts of the world, it is a matter of surprise and great dissatisfaction to me that the present facilities of operation have not allowed a much greater advance artistically than I find. Now you know when a man has to paint a picture or design, a cartoon, or take a photograph by the collodion process, his spontaneity is necessarily handicapped by the continuity and difficulties of the absolute physical work to be done; and the long breath —*le longue haleine*, as the French say—may be exhausted before he comes to the close of his performance, and we may naturally pardon him something if the attempt surpassed the execution. But in photography—*i.e.*, modern photography—surely this is unpardonable, and one has seriously to reflect whether, after all, this is not our most important lesson—viz., the small advance in genuine art in modern times. Perhaps the fact that photographs being more numerous emphasises the case of pictures being so few.

I shall now bring my paper to a close by briefly summarising my observations, the more desirable because of their necessarily discussive character. Firstly, we have seen, I think, that the best negative may be done ill justice to by injudicious printing. Secondly, that obscurity and negation of sharp focus, or reasonable definition, does not necessarily imply fine art. Thirdly, that the grain of the paper used in printing should not be a matter of fad, but is seriously and actually a matter of absolute scale. Fourthly, that exaggeration and affectation is an affront to æstheticism and pure taste. Also let me add that, however a society may deem it expedient, and even honest, to medal works tendered to them for exhibition on the sole principle of encouraging worthy effort by such means, the amateur must use his own discretion, not being scared into blind worship of such work, but sift the matter for himself, and learn to discriminate between laudable effort and entire success. If the amateur does not do this, he will be unquestionably one of those who, following blind guides, fall by the way. Now one word to this Society in particular, who have honoured me by their kind and patient attention so far. I take it that most of you, by your very presence here to-night, if I may be allowed to say so, listening to my dry but really earnest talk, have an equally earnest desire to do some really good work, and will take not a little pains for the mere love of art to do something more than pour ounces of developer over glass plates, and mess your fingers *pour passer le temps* in the interest of the dry plate maker, or for the production of fog, as each of you has a desire to do something really worth looking at.

Of course in a Society like this there are many who have done so already, but I am not speaking to them, but to those, if there be any who have not been so fortunate, who are the real amateurs—I say to these: Don't fritter yourself away in formulas—the snare of all beginners; master one process, and, being assured that under most circumstances you can obtain a technically good negative, don't bother yourself about the chemicals any more, but devote yourself to your art, your greatest art, the art of photographing nothing, unless you see some reasonable chance of getting a pleasant composition, an interesting subject with agreeable and harmonious lines in it; something that shall not hereafter pall upon you, something that you can endure to live with, and that your friends shall say very nice to, and really mean it when they say it; then when you have done this you may conscientiously lay the flattering unction to your soul that you have been working on the right road, and are far nearer ultimate success than some of the exhibitors in Pall Mall who, "troubled about many things," are, it seems to me, giving far more attention just now to processes and chemicals—to say nothing of blurred focusses—than they are to art. Art is art. Your art, Amateur Photographers of West Kent, is the art of photography, which again is the art of expressing your feelings and sympathies, something of your own *ego*, something of your own souls, if you will, by photography, "mere photography;" never be ashamed of it. Let every tub stand on its own bottom. The photographic tub, if only true to itself, shall hold a dignified position; it can never be a reproach to a photograph that it is a mere photograph if an artist has selected the subject and photographed it earnestly, and with this axiom ever in his mind, viz., that though "art fulfils itself in many ways," the highest purposes of any art are not fulfilled in imitating, however well, the technical qualities of another.

---

It is requested that all books and papers which are intended for presentation to the Photographic Society, towards the foundation of its library, may be addressed to the Secretary, at the Society's Rooms, 50, Great Russell Street, London.

### MISS MARR AND HER DETECTIVE CAMERA.

Miss Marr is a young lady rather under than above twenty years of age, and of a most light and blithesome nature. Indeed, her vivacity and playfulness are her prominent characteristics. We may mention also in passing that she is an enthusiastic amateur photographer. Now this interesting young lady has for some time been receiving the earnest attentions of two young men of Carpentersville, Edwin R. Cole and Alonzo Doubleday. Each is an excellent young man, a member of the Young Men's Christian Association, and a teacher in the Sunday school. There was really little choice between them, and Miss Eunice has found it impossible to decide which one to select. Under ordinary circumstances she would, of course, have taken the one to whom her parents objected, but, unfortunately, these worthy people, for some unknown reason, did not look with any great favour on either. She did not, however, allow her anxiety in deciding to interfere with her buoyancy of spirits. In her extremity she hit upon this ingenious plan: she determined to insist on an elopement, arranging with each of them for the same night, and then go with the one who arrived first. She accordingly instructed Edwin R. Cole to put a ladder up to the north window of her room at two o'clock Tuesday morning, and told Alonzo Doubleday to do the same at the west widow at the same time. One must almost certainly come a little before the other, and the other could scarcely blame her for not waiting. Having thus settled the perplexing question, she went about for the next few days with even a lighter heart than usual.

Monday night, when Miss Marr retired she set the alarm on her clock for half-past one. Arising at that time, she was ready in fifteen minutes. Then she got out her detective camera and put it in readiness, her idea being to take a snap shot at the minister during the ceremony. This attended to, she sat down, and waited the arrival of the man who was to be her husband with her young heart in a pardonable flutter, something which was doubtless increased by the pleasing uncertainty as to whether it would be Edwin R. Cole or Alonzo Doubleday. At one minute before two she heard a slight noise outside the north window, as she thought. She listened, and it seemed at the west window. A horrible thought flashed upon her. She rushed to the north window; Edwin R. Cole was wrestling with a heavy ladder below. She rushed to the west window; Alonzo Doubleday had a ladder about half-way up. She stepped back and paused one moment. Simultaneously through the darkness she made out the upper end of a ladder rise at both the north and west windows. She saw that the time had come to act, and she did not hesitate. Going to the north window, she spoke to the ardent Cole, and told him to take his ladder around the corner to the west window. Quickly passing to the west window, she instructed the fervid Doubleday to carry his ladder around to the north window. Each impetuous young Romeo seized his ladder and started with it in an upright position. They met at the corner in the darkness. One ladder fell against the house with a loud report—the other crashed into a tree. Then these two young men fought. There, amid the wreck of the ladders, they clinched in almost a death struggle, and shouted and used language which startled and shocked the lonely night watchman on his beat, hardened and profane man though he was. In the thickest of it, while they were belabouring each other over the head with rungs torn from the ladders, there was a bright glare of light from above. The coy young girl that each had thought to make his bride had taken a flash-light photograph of them. The night watchman then came up, and, after clubbing them judiciously, arrested them. They were fined ten dollars apiece in the morning, and each used the money to pay it which he had intended for the minister.

Nor was this the end of it, sad as it is. It is now announced that Miss Eunice Marr will not marry either of these young men, but a pale youth who sings in the choir named Foster; while the Y.M.C.A. is taking steps to expel both Cole and Doubleday on the strength of the watchman's report of their language; and the playful Miss Eunice is printing off her flash picture at the rate of fifty a day, and selling them, the proceeds to go to the foreign mission society.—*The Photographic Globe.*

## Notes.

The amyl-acetate lamp is not alone useful for the purpose of testing photographic plates, and for employment as the unit of light in photographic research, but it can be made of value as the source of illumination in the developing room lantern. The only alteration necessary would be to slip off the removable spring clip which carries the standard screen with its small aperture, and to slip on another spring clip carrying an opaque tube with the bottom of which to cut off the light from the top of the flame, so as to minimise variations due to flickering. Light paraffin spirit, commonly called benzoline, will practically do well enough to burn it when it is used for developing room purposes. If the parts of lamp were to be made by special machinery, so that the retail cost should bear a moderate relation to the cost of the metal plus the labour, possibly it might have a world-wide sale among the general public for household purposes. The present little benzoline lamps sold in the shops in such large numbers at a few pence each, have a wretched arrangement for raising the wick, which arrangement soon gets out of order. We know of a case in which some individuals made diligent inquiry in lamp shops over an area of about two square miles in London, in the attempt to get better benzoline lamps with good double screws for raising the wicks, but were unsuccessful in the search; in fact, such lamps do not seem to be in the market. The general public, of course, would care nothing whether such lamps did or did not give a standard light of use in photometry, but any manufacturer who produced them might as well give the standard dimensions settled by the Paris Congress, as any other dimensions.

Some weeks ago we put the question why glass studios should not be jacketed, on the principle of the double-windows so extensively used in houses in Continental Europe, in order that the interior may keep comfortably warm with a small expenditure of fuel. One friend at once ridiculed the idea as "impracticable," but a week or two later came the letter from our St. Petersburgh correspondent, setting forth that in that city nearly all the glass photographic studios *are* jacketed; the outer glass "skin" is usually about eight inches everywhere from the inner skin. The arctic weather in London during the past three weeks may cause photographers to think a little about the merits of such studios, and also to think whether there would not be some wisdom in the introduction of the double-window system into all English houses. In Iceland the very cattle have double doors to their homes, as represented in one of the photographs taken by a member of the party of amateurs which recently visited that bleak and desolate country. The photographs were such as to send a cold chill through those observers whose tastes lead them to prefer the sunny south, the regions of the myrtle and the vine, of the palm tree and the orange blossom.

Another subject on which the professional photographer may well brood in this dark, inclement season is, why the smoky air of British towns should be allowed to come between him and the solar source of his more immediate means of subsistence, as distinguished from the term potential energy when employed in a scientific sense. The Londoner pays so much a ton for coal, then burns it in such ignorantly constructed grates that about three-quarters of the heat for which he has paid escapes up the chimney, accompanied by myriads of "blacks" to do injury to the poor photographer. The jerry-builders are answerable for much household waste and misery. With the intensely conservative nature of uneducated men who follow small mechanical trades, they imitate the methods of their fathers before them, and turn out pie-crust houses with bad drains, bad ventilation, ignorantly devised grates, ugly architecture, and so on, their only excuse being that the house is constructed to fall down at the end of the lease. The average Briton has to put up with these rotten homes, because he is practically divorced from the possession of any of the soil of his own country—except, perhaps, the six feet or thereabouts of which he may be the possessor in the end.

St. Peter at last has become a subject of joking in the photographic world, or rather in the *Photographic Globe* in italics, for in that journal appeareth the offence:—

*St. Peter*: "Who are you?" *New Arrival*: "An amateur photographer." *St. Peter*: "You will find the dark room down below."

Why St. Peter should be dragged into the photographic world is not clear, for there is no record that he had anything to do with photography; but those jokists who deal with him in comic papers are in danger, as evidenced by the following narrative from last week's *Pick-Me-Up*:—

Not a few stories, of more or less doubtful origin, have been told of St. Peter; but the following can be vouched for:—The janitor was enjoying a cool siesta, when he was aroused by the dismal strains of the "Dead March" rising from beneath. Thinking, however, it could hardly mean business coming his way—it very seldom does of late—he was again composing himself to sleep, when lo! the usual tap at the door. "What do you want?" asked Peter, peering through a chink, for he has to be very circumspect nowadays. "Who are you?" "I was the champion jokist of a leading comic paper. So sorry I had to come away just now; I had just excelled myself. The funniest thing I ever did. They are bringing it out in this week's ——." "Yes, I know," said the doorkeeper, gently, as the last melancholy note of the "Dead March" was wafted to his ear, "I hear them at it!" And as he drew the bolt of the trap-door on which the jokist stood, the latter slode gracefully down the pneumatic tube.

The photographer deals with not a few solutions and salts which deteriorate from exposure to air, and various are the dodges which he will adopt to prevent atmospheric oxygen from playing its accustomed pranks. There is now in the market a form of bottle which will be prized by many, for by a simple movement the stopper fitted to it makes the closure comparatively airtight. We trust that this form of stopper may be adapted to bottles of different sizes for the use of photographers and chemists generally, but at present it seems to be relegated to a far more lowly employment. It is as a receptacle for pickles, standing on a dinner table at a restaurant, that we saw it. The stopper consists of two discs, connected at their edges by a band of red rubber. When a lever on the top is depressed, the two discs are brought nearer together, and the india-rubber band is bulged out, thus pressing against the neck of the bottle. The oxygen of air exceedingly slowly passes through india-rubber, but more quickly than the nitrogen.

---

Photographers who are interested in geology, and who wish to find in a small compass ready to their hand different examples of rock formation, and geological phenomena, cannot do better than pay a visit to the Isle of Man. The journey is not a very tempting one at this time of year, for only one boat crosses daily from Liverpool, and it starts at such an hour that he who would be a passenger by it must leave Eustou by the newspaper train at 5.15 a.m. There is, too, an uncertainty about the duration of the voyage. Nominally it is five hours, but when a fog comes over the estuary of the Mersey that period can be drawn out indefinitely, as it was one day lately, when the voyage from coast to coast occupied twenty-eight hours.

---

But in the summertime things are different. Swift boats are employed, which cover the distance in less than four hours, and the journey is worth a little inconvenience, for the island is full of beauties. But what we particularly wish to call attention to are the wondrous rock formations which girt its coasts. In one spot in the south, covering a distance of only two or three hundred yards, we lately came upon several typical forms of rock, and one which we believe to be unique. Here, for instance, was a splendid example of a "fault." Close by was a trap-dyke jutting out like a wall from the stratified limestone on either side. Within a stone's-throw was a stack of black basalt, with the typical hexagonal plates crowning the mass, while masses of lava also pointed to violent volcanic disturbance in the long-forgotten past.

---

The unique appearance is found in a bay in which the rocks have been violently upheaved, so that their natural "bedding" stands vertically instead of horizontally, as they were originally deposited. To-day they stand up like so many fingers pointing to the sky, and in their midst is a clearly defined crater, the edges of which are formed of this same limestone, more or less crystallised and metamorphosed by the intense heat to which it has been subjected. A weird spot is this, which might inspire painter or poet if bent on depicting the infernal regions. One painter, at least, was so inspired by the rocks which girdle the Isle of Man; this was Martin, who studied here, and produced those three vast pictures, one of which is called "The Great Day of His Wrath."

In the present dull weather—for in London we have been something like thirty-six days without a gleam of sunshine—the illustrated papers, especially those which depend upon reproduction of pictures in foreign and American journals, would have been seriously inconvenienced but for the electric light. All photo-mechanical engravers in a large way of business find the electric light indispensable. How to get out the blocks with only the murky grey light of the past six weeks to work by would have been almost an impossible task. For this reason, if for no other, the reading public should be grateful to electricity.

---

It is a curious thing that the hairless-faced man is the one whom artists find most difficult to portray. The subtle play of the features which the beard and moustache conceal is here shown to an extent which drives the artist to exasperation, because of the rapid changes of expression. There are certain faces which are perfectly inert and expressionless when in repose, but, when animated, the countenance lights up, and quite another man is presented to the spectator. Mr. John Morley has one of these tantalising faces, and is not only the despair of cartoonists, but is considered by artists who have to draw him for illustrated papers as a most difficult subject. Most photographers are familiar with faces of this type; whether taken full face, three-quarter view, or profile, they are equally unsatisfactory, and the worst of it is, so far as the artist is concerned, when he draws from a photograph, that this is the kind of face upon which the retoucher exhausts himself, and, in so doing, succeeds in destroying all individuality.

---

The difference which the beard makes is well seen in the altered appearance of Mr. Herkomer, R.A. Mr. Herkomer's bearded face was not a difficult one to draw, but as he was seen at the *Graphic* dinner, with every vestige of hair removed, we should fancy that most artists would like to have time to study the new lines thus presented, before attempting his portrait.

---

Photography is continually adding to our knowledge of astral phenomena. Admiral Mouchez has recently had the pleasure of minutely examining the magnificent photograph of the annular nebula in Lyra, which has been made for him at the Observatory of Algiers, by Messrs. Trépied and Rabourdin. Hitherto observations of this nebula have appeared to indicate that the bright central nucleus and the brilliant nebulous ring surrounding it are distinct and separate. Admiral Mouchez has found, in examining the new photograph, that this is not so. The two bodies are not entirely separated, but the intervening space is faintly illuminated with nebulous matter. To the unscientific mind this discovery may not be of any importance, but in astronomical study it is impossible to say to what a new discovery may lead.

## IMPRESSIONISM IN PHOTOGRAPHY.*

BY GEORGE DAVISON.

I see no reason, then, why photography should not be used to express our impressions of natural scenes as well as any other black and white method. (I have, of course, all along intended that colour should be kept out of any comparison. The waut of colour places a method altogether upon an inferior level.) Worked under the same conditions as the eye, or under conditions as nearly approximate as possible, nothing gives so truthful a record in drawing as photography, and nothing, in my opinion, when the proper means are used and the requisite knowledge is possessed by the photographer, gives so delicately correct a relation of tones. It is to the proper use of the proper means at their disposal that photographers still need stimulating. The most important of these means are such as are directed to securing the proper light effect and relations of light values, and those which give the focussing and relative interests of the subject. In photography, the subject of focus has altogether overshadowed the more important matter of tone, for no one, except Captain Abney, has given this latter any scientific atteution. It is impossible now to go into the subject of means and methods, but it is worth while noting that some of the simplest facts of light are overlooked by photographers, who have been governed by untrue and misleadiug conventions and dogmas concerning gradation and brilliancy. For instauce, the necessity for points of the deepest black is insisted on, in order to give scope for as long as possible a series of steps up to points of white, regardless of the fact that this black is generally much too black for the purpose in hand. A little experiment would show how light out-door shadows should be as a rule. For iustance, the darkest shadow out of doors seen at a little distance is *lighter* than the shadow side of a *white* curtain *in* a room. Consequently, it is of first-rate importance in landscape pictures to keep the shadows light. To repeat the impression of out-door light the whole picture must be luminous, and not heavy and dark, as is the effect of the ordinary style of developiug, and the use of albumenised silver paper. Further, the shadows when the sun shines are lighter than when he is obscured. Or, again, there is the elementary observation that many objects seen against the blue sky come light on dark. The photographer has beeu so accustomed to obtaining a blank white sky on a blue day in his prints that he arrives at a conviction that this is correct. So much so, indeed, that it is related in the journals that the early photographers prided themselves upon their beautiful white skies, and would have no others.

In regard to focussing, again, there are, similarly, misleading conventions which prevent the free and general use of the full powers of photography. We still hear repeated the doctrine that miuute definition is the distinctive quality of photography, and that, therefore, this should be made the most of in artistic work. Even if it were, it would be sufficient answer to this that such definition is uot the distinctive characteristic of *seeing*. But definition is no more the distinguishing feature of photography than is exaggerated perspective, or, indeed, want of definition that is diffusion or softness. This depends upon the instruments used. We are told that in any broad treatment by focus we are imitating the natural characteristics of a certain school of painting. It might, with equal force or no force, be alleged that those in favour of minute definition are, in their sharpest tendencies, apeing the characteristics of the old miniature workers. Whether in painting or photography, it is purely a matter of the instrument used and the use made of it. In the one, either a fine point or a broad brush may be used. In the other, the optician's idea (a scientific aspect) of perfection in a lens is surely not expected to sway those bent on giving æsthetic pleasure. Everyone has seen that so-called mathematical accuracy is not necessarily artistic truth. Nothing but what observation or science can establish can be adopted as a principle by a naturalistic photographer. That the eye with one point of sight sees in different focus near and distant objects everyone admits; within what limits and with what differentiation is not so clear. If mere observation and feeling are of any weight, I should say that in some subjects the relative interests are given best with considerable differentiation, and in others the effect on the mind is best gained by general diffusion. I am aware that this is somewhat opposed to the very forcible argument in favour of one point of sight for focus as for perspective in any picture; but in many instances the difference of effect in the two treatments does not appear important, and is by no means easy to distinguish, even by expert observers.

A not unimportant consideration, bearing in some measure both upon the matter of values and definition, is the printing medium employed. I find, in the newest extra rough-surfaced papers, very excellent and distiuctive qualities, in respect, particularly, of breadth and luminousness. Some extraordinary objections have been taken to the results on these papers as not being photography because they bear resemblance to wash-drawings; and one gentleman finds in this, and the character of diffraction photographs, an opening of the door to any and every kind of brush-work upon the print. But the answer is, first, that there is no aim to get wash-drawing appearance; and secondly, all the process is pure photography. Both the photographer and the painter have the same aim, and it is not surprising if printing upou the same papers produce similar results, for photographic deposit more resembles painted surfaces than any other method. Both work in tones, or shades of monochrome, and both may be worked upon any medium which promises to give more truly and more effectively our impressions of nature. It is certainly very refreshing in its audacity to be told that, because photographers have consented to smirch the fair name of their art by the general use of albumenised paper and small stops, therefore this is to be its character for ever. In some respects the use of these rough papers, which are only now likely to become general for artistic work, constitute one of the greatest advances yet made. It need hardly be said that rough paper will not make a bad picture good or great, but it will do this: It will make all the difference to the majority of educated spectators between interested observation and contempt. It is difficult to overestimate the importance of the printing medium, as far as the credit of artistic photography with the critical public is concerned. There is almost as great a superiority for most subjects in the new platinotype paper over the ordinary platinum surfaces, as there is betweeu these latter aud silver printing. This quality of the printing has more effect upon the casual tasteful observer than any other quality of the production. The defective printing medium has obscured the qualities of photography. The effect of prints upon such papers as I allude to at once shakes the superstition of honest critics, who have hated photography for its hardness, vulgarity, and untruth. These extra rough surfaces I consider the best printing medium that has been introduced, not excepting reproduction of the negative upon a copper-plate or photo-etching. Unfortunately, the difficulties in the way of quick production must probably leave the field of commercial publication to the photo-etching process.

This leads me to say a word in comparison of photography with other black and white processes. It is admitted to have very justly been the death of line engraving. We have heard much about the interpretation of a painting by the engraver in black and white; but both painter and public who wish to see retained the original quality of the work must prefer a photogravure to the hard, formal, and unnatural character of the line engraving. Photography has pre-eminently more of painting qualities than any other monochrome process. Take etching, for example. Which is the better adapted for reproducing natural effect, photography or etching by line? Mr. P. G. Hamerton, in his standard work, "Etching and Etchers," compares etching with other arts, and finds the superiority of etching in its power to express form, and in its freedom, precision, and power. He admits that "perfect tonality is very difficult in etching," and that other arts are better in the representation of clouds. He recognises that the brush is better than the point, because lines do not exist in nature; but he contends that painting is not quite so well adapted to the expression of transient thoughts. How does etching com-

* Concluded from page 1010, vol. xxxiv.

pare with photography in these respects? I venture to think even less favourably than with monochrome painting. Photography is not specially limited to, nor compelled to emphasise, facts of form. It gives form by means of tone against tone, and that is the best means of rendering it, and its truth of form is unequalled. In regard to tone, it is equal to any other black and white process, not excepting mezzotint, to which, indeed, it is often superior in respect of delicacy of gradation. This, of course, only refers to photography used at its best. We are considering its powers, not the average of its productions. The crude, ignorant workmanship that is so common is no fair test of its capabilities. For instance, let it be admitted there are great difficulties in a large range of subjects in respect of rendering their relative light values, and the ordinary practitioner very rarely takes any trouble to overcome them.

Further, then, every observer knows the perfection of photography under suitable conditions of light as regards transient action and effects, and in nothing more than cloud forms is the delicacy of its tonal discrimination shown. But Mr. Hamerton would say that all this technical perfection—even if he admitted it—is useless, inasmuch as the camera is incapable of what he calls "idealisation of natural form, emphasis in lines, and concentration of natural light and shade." These very vague qualities are, to him, the artist's especial and peculiar work. As I have already treated this matter to some extent, I will here only refer to the etchings in Mr. Hamerton's book for an example in illustration of my argument.

Some of the finest etchings in the work are photographic in character—using photographic in the best sense of giving true tone, drawing, and simple naturalness, without any playing with facts—such, for instance, as that by Rembrandt ("Rembrandt drawing"), those by Lalanne, and in part that by Whistler. Referring to the Whistler etching of "Billingsgate," Mr. Hamerton notices, with just appreciation, the observant work in the buildings on the quay, and he refers to the harmony in the festoons of the converging cables of the boats as approaching poetical synthesis. I should prefer to call the rendering of these festooned cables a bit of most natural analysis. It is the result of close observation, with a marvellous power of expressing the leading facts exactly as we know them, and as Whistler saw them. The exquisite pleasure that this bit of the drawing gives is due to the natural way in which the impression of ropes forming long curves away from the eye and dipping in the stream is reproduced with a simple touch. In short, it is artistic truth—the truth that the artist wanted, unencumbered with local facts of which he would not be conscious save by scientific examination. This is true imitation, an exact hitting off of the leading fact, a power thought to be easy and mechanical, but one as rare in graphic as in literary art. Photography may never have yielded such subtle and exquisite analysis as this, and as the suggestion of heaving water, but photography has yet to get its Whistlers, and it works in a manner very different from etching. In the same etching it is strange that there should be such evidence of slovenliness and want of observation in the character and the form of the boats, which are egregiously unlike any vessel ever found at Billingsgate or elsewhere. Perhaps this would pass for exaltation of the natural images with Mr. Hamerton, but it would be painful to those educated by observation of the character of the objects.

Mr. Hamerton would have conferred lasting credit upon his insight had he, against the rigid prejudices of the time, been able to recognise the just claims of photography, and had he included for comparison in his book, "The Graphic Arts," an example of photography at its best. Others, at any rate, are now able to see its power for expression of artistic feeling, a power budding under naturalistic influences and a more severe scholarship in the *technique* of the art. If the power of expressing artistic impressions by photography is impossible, then must all the work of the naturalistic school of painters be excluded from the pale of graphic art, for theirs is confessedly "an honest attempt to paint what they see," and photography, artistically employed, has the same aim.

Concerning photographs bearing somewhat the naturalistic character, that is, with truth of tone and suppression of unnatural detail, it is no uncommon thing to hear it said, "Oh yes, they are artistic enough, but they are not photographs." Such is the domination of conventional views. I believe, indeed, that some of our friends are prepared to accept this view, and we have an ingenious suggestion that as there are painter-etchers so there should be painter-photographers, a name to be accepted, I presume, either on the *lucus a non lucendo* principle that all painting is rigidly excluded from their plates and prints, or to proclaim that they gladly admit the soft impeachment that their photographs are guilty of looking like sepia drawings.

Be that as it may, I will now only say in conclusion that it is such work that has been most instrumental in breaking down the wide-spread prejudice against photography as an essentially mechanical, harsh, and vulgar medium for anything like artistic expression, and that it is in that direction we shall have to look for its elevation to its proper place amongst foremost black and white processes. It is from no mere formula of fuzziness or definition that the best work derives, or can derive, its quality; but from the acquisition of artistic facts by observation and experience—facts of light, the limitations in black and white work, the relation of light surfaces, orthochromatics, relation of objects in respect of focus or mental interest, study of form, action, and typical character, the use and application of lenses, knowledge of the subtleties of development with the relation of exposure thereto, and the study of the qualities of printing processes. This is no question of months, but a matter of years before a man can hope to see clearly what it is he wishes to express, and move freely in expressing his impression. We need not be discouraged that unnatural "exaltations and combinations are impossible to us. The quality of naturalness will tell in the long run. Men will weary of emphasis, and graphic artists will leave past history, archæology, and fiction to literature or scientific drawing. The keenest æsthetic pleasure is to be derived from the spirited, truthful rendering of character, whether in face, figure, or landscape. The things of to-day will be of deeper interest to-morrow. As Emerson says "It is in vain that we look for genius to reiterate its miracles in the old arts; it is its instinct to find beauty and holiness in new and necessary facts, in the field and roadside, in the shop and mill." The scope of photography is extended. Nature will never go out of fashion. Prejudice will fade, and even one generation ahead will find the value of photographic portraiture, if it be natural and permanent, as it may be. The prospect is worthy of work, devotion, and sacrifice, and, in our enthusiasm, we may be forgiven for indulging visions of a time when, with Truth and Nature as its watchword still, photography shall have taken to itself such glorious attributes that, with fewer limiting conditions, our every impression of the visible world, light, colour, action, and form will come within its scope to express.

---

The Photographic Society.—The next meeting of this Society will be held on January 13th in the Society's new premises. A paper, which was unavoidably postponed from the December meeting, will be read by Mr. E. W. Maunder, F.R.A.S., on "Photography Applied to Astronomy," and Mr. W. England will give a flash-light demonstration. Mr. Cocking having resigned the position of assistant secretary, the Council have appointed Mr. H. A. Lawrance to the vacant position. Mr. Lawrance will take up the duties of the appointment on January 1st, 1891, and from that date members' subscriptions are to be paid to Mr. H. A. Lawrance, 50, Great Russell Street, London, the Society's new premises. These are opposite the British Museum, and will be open from January 1st, 1891, between the hours of 2 p.m. and 9.30 p.m. each week-day. After that date all meetings will take place in these premises, unless otherwise notified. The dark room will be prepared for use and the library put in order as soon as possible. No paper will be read at the anniversary meeting on February 10th, 1891, which will be devoted to the consideration of the report of the council, the election of a new council, and other general business. Members who wish to raise any question as to the management of the Society are requested to bring the matter forward at the anniversary meeting.

## THE PICTURES AT THE EDINBURGH PHOTOGRAPHIC EXHIBITION.—IV.

### CLASS V.—PORTRAITS ABOVE 10 BY 12 INCHES, IN SETS OF SIX DIRECT PRINTS.

IN this class are some of the most prominent pictures in the Exhibition; many are on 20 inch and larger plates. They comprise large groups, and single figures from full-length to life-size busts. Of the fifty-four exhibits, all are in platinum save six, and two of the latter are on plain paper platinum toned.

William Crooke's works are quite a feature of the Exhibition. They have fortunately been almost all grouped together, and, as they are quaintly framed in old-fashioned black moulding with antique gilt slip, and only a narrow white border with a thread line is seen outside the platinum print, they closely resemble in effect a number of old-fashioned engravings. These are most characteristic portraits of notables in the legal world, in wig and gown. In many cases Mr. Crooke has been most happy in securing a pose that specially individualises the subject. Besides these, Mr. Crooke exhibits a life-size bust of M. Paderewski, from a plate that must have measured at least twenty-six inches. Some might think this under-exposed, but it is bold and striking.

Marshall Wane shows good work. No. 460A is an effective twenty-inch bust, well lighted and posed, brilliant yet soft; No. 462 is a three-quarter length of a child in a rakish hat, rich in colour; No. 465, on a plate not less than twenty-four inches, is a soft and delicate bust; No. 604 is a three-quarter length of a lady, somewhat low in tone, but quite in keeping with the subject, natural and unconventional in treatment.

Messrs. Wane and Allan exhibit several full-length subjects noticeable for their rendering of flesh-tint; No. 401 is a pleasantly posed child, rich in colour; others by the same firm with similar qualities are somewhat formal in pose.

Alexander Ayton, jun., sends a number of finely-lighted figures. No. 398, representing two children coming down some steps, is specially bright, happy, and natural. No. 414 is a bust of an elderly gentleman, showing fine flesh texture.

Wm. Warneuke shows a remarkable set of character studies of large size, among which "Portia" is notable for its simplicity of pose, "Herman Vezin" particularly striking for its strength, and "Desdemona" for softness and delicacy. In all his work there is a fine harmony between the lighting, pose, and expression.

John Moffat, in No. 595, exhibits a good profile bust very tenderly treated; No. 621 is also a capital bust full of flesh-tone, and No. 451 is a beautiful boy natural in pose.

Wm. J. Kilpatrick has a very pleasing picture of a child in its night-dress going upstairs with a candle, entitled "Good Night."

R. R. Russell shows a natural and well-composed group of two young ladies at a piano.

R. Slingsby again exhibits some of his remarkable flash-light work, notable for breadth of illumination.

J. Martin shows a brilliant print of a young lady in white drapery. Other exhibitors in this class do not call for particular comment. X. Y. Z.

## THE AWARDS AT THE EDINBURGH PHOTOGRAPHIC EXHIBITION.

Annexed is note of Awards by the Jurors at the Edinburgh Photographic Exhibition, forwarded by Mr. J. Barclay, hon. secretary.

| CLASS. | SILVER MEDAL. | BRONZE MEDAL. | HONOURABLE MENTION. |
|---|---|---|---|
| 1.—Landscape ... ... | Richard Keene, Derby (681)... ... ... | C. Digby Jones, Edinburgh (529) .. ... | J. P. Gibson, Hexham (226, 230) |
| 2.— Do. ... ... | F. Boissonnas, Geneva (708) ... ...<br>H. P. Robinson, Tunbridge Wells (631) ... | J. P. Gibson, Hexham (179) ... ... | G. Bruce, Duns. (532) |
| 3.—Portraits ... ... ... | J. Moffat, Edinburgh (479) ... ... ... | Marshall Wane, Edinburgh (458) .. ...<br>Alexr. Ayton, jun., Edinburgh (386, 387) | |
| 4.— Do. ... ... ... | Window & Grove, London (241, 288) ... | J. G. Tunny & Co., Edinburgh (699, 713) | |
| 5.— Do. ... ... ... | William Crooke, Edinburgh (368, 379, 380) | Marshall Wane, Edinburgh (410, 440, 460A, 462, 465, 604) ... ... ...<br>Alexr. Ayton, jun., Edinburgh ... ... | |
| 6.—Figures ... ... ... | J. H. Hogg, Kendal (376) ... ... ... | R. S. Webster, Edinburgh (659) ... ...<br>Ralph W. Robinson, Redhill (789) ... | |
| 7.—Combination Printing ... | No Awards. (None considered of sufficient merit.) | | |
| 8.—Genre ... ... ... | Lyd. Sawyer, Newcastle (335) ... ... | J. Terras, Markinch (288) ... ... ... | A. Diston, Leven (909) |
| 9.—Instantaneous ... ... | Charles Reid, Wishaw (598) ... ... ... | Lyd. Sawyer, Newcastle (325) ... ... | |
| 10.—Architecture, &c. ... | William Mitchell, Dalkeith (492) ... ... | Richard Keene, Derby ... ... ... | |
| 11.—Scientific ... ... ... | | A. Pringle, Bexley Heath (71A) ... ...<br>C. Piazzi Smyth, LL.D., Clova (84c) ...<br>Gambier Bolton, F.Z S., London (85) ... | |
| 12.—Landscape ... ... | J. Livingstone, jun., Edinburgh (190) ... | Dr. Stewart, Edinburgh (143) ... ...<br>T. D. Duncan, Glasgow (238) ... ... | |
| 13.— Do. ... ... ... | J. H. Forbes, Edinburgh (260) ... ... | J. K. Taylor, Buxton (1031) ... ... | J. E. Austin, Detling (579)<br>R. Kidston, Stirling (394) |
| 14.— Do. ... ... ... | J. G Patterson, Eskbank (185) ... ... | W. Mitchell, Dalkeith (165) ... ...<br>Major Redon, Glencarse (192) ... ... | |
| 15.—Prize Pictures ... ... | No Awards. (The Jurors unable to select one as distinctly outstanding.) | | |
| 16.—Lantern Slides ... ... | Geo. W. Wilson & Co., Aberdeen (1076) ... | James Dore, Sandown (1075) ... ... | |
| 17.—Reproductions ... ... | Autotype Co., London (899, &c.) ... ... | James Patrick, Edinburgh (804) ... ...<br>William Crooke, Edinburgh (390) ... ... | |
| 18.—Vitreous Enamels ... | H. P. Robinson, Tunbridge Wells (64) ... | J. G. Tunny & Co., Edinburgh (55) ... | |
| 19.—Photo-mechan. Prints... | Autotype Co., London (883) ... ... ...<br>Walter L. Colls, London (833) ... ...<br>James C. H. Balmain, Edinburgh (874) ...<br>W. J. Annan & Son, Glasgow (886) ... | | |
| 20.—Enlargements ... ... | F. H. Worsley-Benison (189) ... ... | T. G. Whaite (491) ... ... ... ... | |
| 21.—Apparatus ... ... | G Mason & Co., Glasgow (Studio Camera-stand) ... ... ... ... ...<br>W. Wray, London (Lenses) ... ... ...<br>J. M. Turnbull, Edinburgh (Hand-camera and Film Carriers) ... ... ... | Wm. Hume, Edinburgh ... ... ... | |

The Jurors have not been able to select any one picture of such prominent merit as to justify their recommending it for the Society's Gold Medal.

## ASTRONOMICAL TELESCOPES.*

BY A. A. COMMON, F.R.S., TREASURER TO THE ROYAL ASTRONOMICAL SOCIETY.

Commencing, then, with the first application of the telescope to the investigation of the heavenly bodies by Galileo in 1609, we find that the largest telescope he could make gave only a magnifying power of about 30.

The first improvement made in the telescope, as left by Galileo, was due to a suggestion—by some attributed to Kepler, but certainly used by Gascoigne—to replace the concave eye-lens that Galileo used by a convex one. Simple as this change looks, it makes an important, indeed vital improvement. The telescope could now be used, by placing a system of lines or a scale in the common focus of the two lenses, to measure the size of the image produced by the large lens; the axis or line of collimation could be found, and so the telescope could be used on graduated instruments to measure the angular distance of various objects; in fact, we have now, in every essential principle, the true astronomical telescope. It is useless as an ordinary telescope, as it inverts the objects looked at, while the Galilean retains them in their natural position. The addition, however, of another lens, or pair of lenses, re-inverts the image, and we then have the ordinary telescope. It was soon found that the single lens surrounds all bright objects with a fringe of colour, always of a width of about one-fiftieth of the diameter of the object-glass, as we must now call the large lens; and, as this width of fringe was the same whatever the focal length of the object-glass, the advantage of increasing this focal length, and so getting a larger image without increasing the size of the coloured fringe, became apparent, and the telescope therefore was made longer and longer, till a length of over one hundred feet was reached; in fact, they were made so long that they could not be used. A picture of one of these is shown, from which it can be easily imagined the difficulties of using it must have been very great, yet some most important measurements have been made with these long telescopes. Beyond the suggestions of Gregory and Cassegrain for improvements in the reflecting telescope, little was done with this instrument.

During the eighteenth century immense advances were made in both kinds of telescopes. With the invention of the achromatic telescope by Hall and Dollond, the long-focus telescopes disappeared.

Newton had turned to the reflecting telescopes, believing from his investigations that the dispersion and refraction were constant for all substances; this was found not to be so, and hence a means was possible to render the coloured fringe that surrounds bright objects when a single lens is used less prominent, by using two kinds of glass for the lens, one giving more refraction with somewhat similar dispersion, so that while the dispersion of one lens is almost corrected or neutralised by the other, there is still a refraction that enables the combination to be used as a lens giving an image almost free from colour.

In 1733, Hall had made telescopes having double object-glasses on this plan, but never published the fact. Dollond, who had worked independently at the subject, came to the conclusion that the thing could be done, and succeeded in doing it; the invention of the achromatic telescope is with justice, therefore, connected with his name.

* Continued from page 1013, vol. xxxiv.

Although this invention was a most important one, full advantage could not be taken of it, owing to the difficulty of getting discs of glass large enough to make into the compound object-glass, discs of about four inches being the largest diameter it was possible to obtain. With the reflecting telescope, unhampered as it always has been by any except mechanical difficulties, advance was possible, and astronomers turned to it as the only means of getting larger instruments. Many most excellent instruments were made on the Newtonian plan. The plan proposed by Gregory was largely used, as in this instrument objects are seen in their natural position, so that the telescope could be employed for ordinary purposes.

Many were also made on the plan proposed by Cassegrain. The diagrams on the wall enable you to at once see the essential points of these different forms of reflectors.

About 1776 Herschel commenced his astronomical work; beginning with reflecting telescopes of six or seven inches, he ultimately succeeded in making one of four feet aperture. With these instruments, as everyone knows, most brilliant discoveries were effected, and the first real survey of the heavens made.

Herschel's larger telescopes were mounted by swinging them in a surrounding framed scaffolding that could itself be rotated. The smaller ones were mostly mounted on the plan of the one now before us, which the Council of the Royal Astronomical Society have kindly allowed me to bring here. The plan nearly always used by Sir William Herschel was the Newtonian, though for the larger instruments he used the plan proposed years before by Le Maire, but better known as the Herschelian, when the observer looks directly at the large mirror, which is slightly tilted, so that his body does not hinder the light reaching the telescope. In all cases the substance used for the mirrors was what is called speculum metal.

*(To be continued.)*

## Patent Intelligence.

### Applications for Letters Patent.

20,438. R. W. Thomas, 70, Chancery Lane, London, "Flash-Light Apparatus for Photography."—December 15th.

20,452. A. Edington and A. Daniell, 3, Great King Street, Edinburgh, "Cameras."

20,501. S. H. Fry, Minerva Road, Kingston-on-Thames, "Holding and Exposing Sensitive Photographic Surfaces."—December 16th.

20,563. Sarah Tucker and W. J. Spurrier, Cotton Lane, Moseley, near Birmingham, "Magazine Hand Camera."—December 18th.

20,774. J. Pitt and W. Hudson, 118, Gooch Street, Birmingham, "Photographic Dark Slides."—December 20th.

### Specifications Published.

18,689. *November 21st*, 1889.—"Washing Photographic Prints." Birt Acres, 131, Richmond Road, Hackney, London.

My invention relates to the washing of photographic silver and other prints; the object of my invention is that the prints may be kept in an upright position in a tank or other suitable vessel of water, in such a manner that they could not stick together, double up, become crumpled, or in any other way damaged.

To secure this object I construct two light frames of wire or any other suitable material (if of metal, protected by a coating of water-proof enamel, paint, or varnish), a little larger than the size of the print intended to be washed, the top of one of the frames having a shoulder projecting at each end to allow of its being suspended in a tank or other suitable vessel; each of these frames is covered with a network of wire or other suitable material; the two frames are hinged together at the base so as to open aud shut in book form. Wheu closed a simple clasp or any other suitable fastening keeps the two frames closed in position; the netwcrks being adjusted to the frame in such a manner that they (the two networks) cannot touch each other, but leave a space of about one-eighth of an iuch between their eutire surfaees, in which space the print to be washed is kept in position, the coutacts of the two frames, when the apparatus is closed, preventing the print slippiug out of the apparatus,

151. *January 4th*, 1890.—"A Developing Dish Rocker." JOHN BOULTBEE BROOKS, Great Charles Street, Birmingham, Manufaeturer.

This specification describes the mechanical details of dish-rocking clockwork, actuated by a spring.

511. *January 11th*, 1890.—"Adaptiug Shutters to Lens Hoods." JOHN EDWARD THORNTON and EDGAR PICKARD, St. Mary's Street, Deansgate, Manchester, Manufacturers.

This invention provides improved means for adapting photographic shutters to lens mounts or hoods, so that shutters having openings of suitable standard sizes may be readily fitted to lenses of intermediate sizes.

In carryiug out our invention, we provide rubber bands or packing of suitable sectional form, as hereinafter described, for insertiou in the aperture iu the back of the photographic shutter.

Through the side of the shutter case we fit a screw so that the end thereof may press behind the rubber band. By turning the screw inwards or outwards respectively, the diameter of the aperture can be diminished or increased. By making the bands of various thicknesses—for instance, $\frac{1}{16}''$ $\frac{1}{8}''$ $\frac{3}{16}''$ $\frac{1}{4}''$—an ample range of sizes is obtained, whilst the screw permits of any intermediate adjustment.

The rubber band is formed with one edge rounded or bevelled, and the other with a projeeting rib thereon. When the band is inserted in the shutter aperture the bevelled or rounded edge of the rubber makes the aperture of "bell-mouth" shape, so that the lens-hood or mount may be easily pushed in, whilst the rib forms a stop which prevents it from going in too far. In order that the band may fit tightly within the aperture, we find it necessary that the thin or rounded edge shall be longer than the thick or ribbed edge, so that the thin edge may have a greater tendency to spring outwards when inserted iu the aperture. This we obtain by forming the band in circular or semi-circular flat strips, having the rib on the inner or shorter edge. Such a band, when made of moderately hard rubber, and sprung edgewise into the aperture, serves the purpose required.

By another method we dispense with the rib, aud simply use a plain flat band, in which case the requisite stop is formed by using a flat ring or washer of the required size, which is inserted in the aperture before the band. We do not confine ourselves to the use of rubber exclusively, as leather, paper, or any other suitable material may be used.

The advantages of the hereiubefore described method of adapting photographic shutters to lenses are that a smaller stock of shutters may be kept on hand, as the various sized lenses may be readily fitted to the standard apertures, instead of having to fit each shutter to a particular size of lens in the usual way; the user can also adjust the opening to fit his lens tightly.

15,789. *October 6th*, 1890.—"Photographic Stands or Holders." ARNOLD ROCHOLL, 68, Skalitzer Strasse, Berlin, Manufacturer.

This iuveution relates to photographic stands which contain a fixed number of photographs, and iu which said photographs are made to ehange their places one after the other by meaus of a slide.

Iu using this stand, the foremost photograph is pressed out, and glides down into a lower eompartment. Upou lowering the slide and lifting it again, another photograph (always the hindmost) is gripped and also transported to the upper compartment, causing the foremost photograph of said upper compartment to slide down into the lower compartment upon its predecessor. Thus the photographs are caused to perform a eircuit from the upper to the under compartment aud back, until the first photograph is to be seen again.

## Correspondence.

### YELLOW LIGHT IN DEVELOPING ROOMS.

SIR,—In the editorial article on page 44 of the YEAR-BOOK it is stated that the explauation—based upon the superior illuminating power of the yellow rays—of the popular error iu favour of red light for dark room work was first published in photographic journalism on Nov. 28th, 1884.

On that date will be found an article by Mr. W.H. Harrison, in which the argumeut is indeed used, but that this was by no means the first time that it was brough; forward is evidenced by the followiug extraets from articles of mine that had previously appeared in the same journal.

Jan. 25th, 1884: "Ruby glass will certainly cut off more of the chemical actiou of light than yellow glass; but then, it will cut off at the same time very much moie of the luminosity to the eye by means of which we perform the operations of the dark room. To make the comparison usefully, we should, either by repeated sereens of yellow, by lowering the souree of light, or by some means, at all events, reduce the inteusity and the quantity of the yellow light uutil it reaches the same amouut of brightness of illumination to the eye that we have with the ruby light, and then see which has the most ehemical effect upon the plate."

May 31st, 1884 (See article on "Coloured *v.* Non-actinic Light," iu reply to Mr. Lewis Wright): "Suppose it to be found that the lower down the spectrum, the less is the photographic action, it would follow as a matter of course that deep crimson, red, or magenta is the proper colour to use in the laboratory. As a fact, however, the red possesses much less illumiuating power than the yellow, yellow green, aud yellow orange, and the question should rather be, Which part of the spectrum possesses the least effect upon the photographic film in proportion to its illuminating power?"

As meutioned in one of those articles, I recognised the value of Mr. Harrison's support in the positiou to which I was led when seeking for a working light less injurious to the sight than the ruby theu insisted upou, but that geutleman would surely not be pleased to find the editor crediting him with what does not beloug to him. W. E. DEBENHAM.

### THE QUAGGA.

SIR,—In your issue of October 31st, received here to-day, you meution the photographiug of some quaggas at the Zoological Gardens in 1872. Iu April, May, and June of that year I was engaged to take a series of uegatives of the animals, reptiles, and birds then in the Gardens for Mr. Fred York; I believed then, as I do uow, that they were some of the finest negatives ever taken in the Gardeus. I ran mauy risks, and one especially with the rhinoceros. I was inside the paddock—to get rid of the railings—when he charged me; I managed to get clear away with my camera—a very heavy one—without a seratch. For this I was sketched in the *Police News*. I learnt a great deal eoncerniug this kiud of work while I was in the Zoo, aud Mr. York gave me great credit for my work. I left England in June, 1872, and have uot returned to it since; I am coming home next year. Mr. York promised me that he would credit me with any honour the pictures received at the Exhibition, but this I never got. I think this must have slipped his memory, as I know he could not, if he tried, be ungrateful; I may say I have a very high opinion of him. I have seen in this country many of my pictures shown on the screen, which seut me back to days gone by. Could I have stayed longer I was going to Palestine, but fate sent me here. I have uot corresponded with Mr. York for some years; I hope to see him in the flesh soon.

You are mistaken about the quagga. They run wild here yet down in the colony, and a few hours from here they are seen. Query: Is it a hybrid? Very often bucks of all kinds will run with a farmer's flocks and cattle for months together. They are slightly marked a very dull colour, not so distinct as Burchell's zebra. A colonial—or anyone else, for the matter of that—could never mistake them if they had once seen them. I shall recognise the animal in your YEAR-BOOK. I will give you the *modus operandi* next mail. I am writing against time, so excuse this disjointed letter.

If you see Mr. York, he will verify this letter. Messrs. Marion, my London agents, send me your journal every week.

I would like to hear from you your own and the public opinion of those pictures I took in the months of May and June of 1872. Mr. York promised this, but I never got it. It must be Mr. Harvey and the dodo, not Mr. York. B. HARVEY.

*The Kimberley Photographic Studio, December 1st*, 1890.

[Mr. Bartlett, the manager of the Zoological Gardens says that the colonials in South Africa commonly mistake Burchell's zebra for the quagga. He is not aware that a quagga has been seen for many years —ED.]

THE WORKS OF THE LATE O. G. REJLANDER.

SIR,—We have pleasure in informing you that we have acquired from the widow of this celebrated artist the whole collection of original negatives, numbering nearly 400, of the finest examples of photography.

It is our intention to shortly hold an exhibition of these works at our show rooms, and to publish them in the form of prints, enlargements, and lantern slides. The photographic public will thus have an opportunity of obtaining at popular prices high-class reproductions of the works of this photographer, who was, as you are aware, one of the finest exponents—if not the finest—of the art side of photography the world has yet seen. A. E. HAYMAN.

*The Fry Manufacturing Company, 5, Chandos Street, Charing Cross, W.C., December 24th*, 1890.

INTENSIFYING WEAK NEGATIVES.

SIR,—The process you describe of Dr. Liesegang for intensifying weak negatives by means of a varnish containing an evanescent aniline dye was suggested by me to Mr. W. J. Wilson about nine years ago, but there are objections to it as a practical process. I know of no aniline dye that will fade by the action of winter light with sufficient rapidity to be of any use; if there be one, then the objection you point out would quickly assert itself, viz., the bleaching over the whole negative, especially if it were left carelessly about face uppermost in the light. Films tinted with the dye and inserted between the negative and the printing paper would be a better way of carrying out this method. A useful plan for intensifying a finished negative (before varnishing) is one I used occasionally some eighteen or twenty years ago, viz., the powder process. This is an immense power in the hands of an intelligent and skilful operator, as by its use a negative can be either generally or locally intensified, according to the exposure of the bichromatized gum coating through the negative; an entirely new negative can be superimposed on the original, or merely the very highest lights strengthened to any amount. GEORGE C. WHITFIELD.

*Watford, December 29th*, 1890.

THE PHOTOGRAPHIC CLUB.—The subject for discussion on January 7th will be "Photomicrography"; January 14th, "Dark Room Illuminants."

IN the course of a discussion at the Photographic Society of Chicago about the best method of making good lantern slides, Mr. Douglass remarked, "It depends more upon the man than upon the process."

IT is said that as the workmen were beginning their daily duty on a fine house which Mr. Herkomer is having built at Bushey, there was a frieze to be carved, and Mr. Herkomer seized the implements and worked away with such a will that before sunset the frieze was finished. The men were bidden to copy it, and had hard work to do so.

# Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the technical meeting of this Society, held on Tuesday evening, the 23rd of December, the chair was occupied by Mr. T. SEBASTIAN DAVIS.

A discussion on the use or omission of the eye-piece of the microscope when photographing microscopic objects for lantern slides was opened by the CHAIRMAN, who said that in his experience there was a certain amount of halation when the eye-piece was used. The eye-piece certainly gave a larger image, but that could be managed by putting the focussing screen farther from the objective. He wanted to know whether any of the members present had had any special experience of photographing microscopic objects with and without the eye-piece. He also mentioned that he had found it necessary to use a very fine ground glass for the focussing screen for this class of work, and he recommended that the transparency of the screen should be increased by rubbing with grease when photographing objects of very minute character. There was also the question as to which kind of plate should be used when photographing subjects that were both of a ruby character as to colour, and that possessed great opacity from the thickness of the body, such, for instance, as the common flea.

Mr. T. E. FRESHWATER had done a large amount of photographing of microscopic objects recently, and if he could possibly help it he never used the eye-piece. He found that there was a tendency to reversal of the image when the plate was at all over-exposed. Only when he could not get a sufficient degree of enlargement without it, did he use the eye-piece.

Mr. W. E. DEBENHAM enquired what were the circumstances which, in Mr. Freshwater's experience, necessitated the use of the eye-piece instead of simply removing the screen to a greater distance for obtaining the required degree of enlargement?

Mr. FRESHWATER said that only when the camera would not extend sufficiently to get the image large enough did he use the eye-piece.

Mr. A. MACKIE said that he had seen a statement by Mr. A. Pringle that nobody now took photo-micrographs without the eye-piece.

The CHAIRMAN hoped that further investigation would be given to the subject.

Mr. H. CHAPMAN JONES asked whether Mr. Freshwater, in condemning the use of eye-pieces, referred to those made expressly for photographic use, or to the ordinary microscopic eye-pieces.

Mr. FRESHWATER said that he was speaking of the eye-pieces made for photographic work. He would not attempt to work with an ordinary eye-piece. He used a 4-inch condenser, and then condensed the light again with a smaller one. The exposure was sometimes very short. Last evening he had photographed the palate of a water snail, merely opening the objective and closing it again.

The CHAIRMAN used paraffin as the illuminating agent, and of course gave comparatively very long exposures. When using the tube of the microscope, without the eye-piece being inserted, he found that there was apt to be a peculiar central flare, which arose from reflections from the inner surface of the tube. He found that a black velvet lining was best for reducing this reflection to a minimum.

Mr. MACKIE said that with a narrow tube even a velvet lining would not suffice to prevent reflection entirely.

Mr. FRESHWATER said that a tube was quite unnecessary when there was no eye-piece. He brought the objective and the front of the camera close together.

Mr. DEBENHAM asked whether any of the members had made comparative experiments as to the advantages of a microscopic objective and that of a photographic lens of an aplanatic character, such as the Petzval portrait lens, for photographing objects up to a certain degree of enlargement.

The CHAIRMAN said that for enlargement up to four diameters he preferred photographic lenses.

Mr. E. W. FOXLEE, as the result of his experience, preferred photographic lenses to microscopic objectives, for enlargement up to twelve diameters.

Mr. H. A. LAWRENCE referred to a formula for developing transparencies that had been quoted by Dr. Kiss, which, he thought, somewhat strange. There was citric acid as well as carbonates of magnesium and ammonia.

Mr. A. COWAN said that citrate of magnesium gave a very good colour, and it was more convenient to make it up by adding citric acid to carbonate of magnesia than to have to weigh out such a deliquescent substance, even if it were generally obtainable commercially.

### THE LANTERN SOCIETY.

*December 22nd.*—Lieut. C. E. GLADSTONE, R.N., read a paper on "Some Architectural Features of Normandy and Brittany." The slides shown were made by the lecturer from his own 12 by 10 negatives on stripping films taken during the past summer. The paper was principally intended to illustrate the characteristic marks of the ecclesiastical and domestic architecture of the country, and the differences between the contemporary styles in England and France were pointed out.

### THE ENFIELD CAMERA CLUB.

AT a meeting held on the 17th ult., Mr. PINKNEY (chairman) read a paper by Mr. H. V. CLEMENTS on "Development."

The writer expressed his opinion that it was important that all development should be carried on by artificial light of a standard illuminating power, by which means it is infinitely easier to judge the exact density acquired than it is possible to do by the ever varying daylight. He advised beginners to select a developing formula—either one recommended by the maker of the plates they purpose using, or one they know some friend is using, and from which they see he gets good results—and then stick to it until they have mastered it. Mr. Clements confines himself to two developers, viz., the pyro-ammonia, and the hydrokinone, prepared according to Mawson and Swan's formula; when developing, he starts off with a weak solution, and gradually increases it until it gets the desired result. He considers that if the plate is flooded with the normal developer at first, unless the plate is correctly exposed, the result must necessarily be faulty, and it is a very difficult task to make it presentable; if much over-exposed it cannot be saved. He would impress upon beginners the importance of having a safe ruby light, and of keeping the plate as much in shadow as possible to prevent fog, for which many developers are blamed, and to see that the plate is covered with the solution free from air-bells, which are easily removed with a camel-hair brush or the finger; he uses the latter, as he always knows where to find one in the dark. Mr. Clements contended that over-exposure is preferable to under-exposure, for when one knows how to use the chemicals, the former can be counteracted, but neither chemicals nor knowledge will compensate for the absence of light. Slow development, he said, is the right thing, for in a quickly developed plate the surface of the film is attacked too energetically at the commencement of the development, and the surface rendered hard and somewhat insoluble or non-porous, preventing to some extent the equable action of the developer at the back of the film, and causing the plate when in the fixing bath to lose much of its pluck and gradations though apparently fully developed. In conclusion, he wished to impress on all beginners the fact that cleanliness is absolutely essential in every branch of photography.

RECEIVED.—We have received from Kimberley the photographic portrait of a South African celebrity, whose white, short pipe stands out in the picture in brilliant contrast to his black face. It is inscribed: "With Umjala's compliments to the White Man who photographs across the sea." Remarking, in passing, that such a feat requires a lens of long focus, we thank the donor, and hope that the fire-water, which he is pictured as pouring from a bottle to a tumbler, was distilled and flavoured to his satisfaction.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the PHOTOGRAPHIC NEWS, Messrs. Piper & Carter, 5, Furnival Street, London.

T. DALY (Tralee).—*Art Instruction.* Since writing to you last week, further enquiries have only served to confirm the recommendation then given. Find out the nearest centre of art classes held in your district, and if that should happen to be too far away to make it convenient to attend, write to the Art Master there asking his advice.

M. F.—*Printing by Development.* Messrs. Farmer and Tompkins's process of silver-gold printing ought to be useful during this dull weather, but the details given at the technical meeting were very meagre, and insufficient to enable you to put it to a practical trial. All that is known about it is printed in the NEWS of April 6th, 1888, page 217, and it does not appear that any patent was applied for.

F. J. THORNTON.—*An Old Relic.* The camera which you happened to pick up is evidently Thomas Skaife's patent "Pistolgraph," which was brought out in the year 1858; described and figured in the *Photographic Journal*, Vol V. p. 98, with further explanations in Vol. VI. p. 231, and Vol. VII. p. 189. It was one of the earliest forms of camera worked with an instantaneous shutter released by a trigger, and originally the whole apparatus bore some resemblance to a pistol, but this was soon discarded in favour of a square camera working flat plates, instead of the one-inch watch glasses with which Mr. Skaife started.

DARKNESS.—*Question of Copyright.* If the photogravure is an actual copy of your original portrait you could probably restrain the publication, and get damages, by applying to the High Court of Chancery, but the process might be costly. We should advise you to register at once, and then you could prevent any further piracy. Your case is so clearly stated, in its legal aspects, by Mr. C. Fleetwood Pritchard, barrister-at-law, in the YEAR-BOOK, p. 87, that we may confidently refer you to that article for specific guidance. You do not say whether your own photograph was ever published, or only taken in the way of ordinary business? The death of an eminent local official, or celebrity, often leads to an immediate demand for his portrait; this you should have anticipated by prompt registration.

J. M.—*Slow Printing.* The only consolation must be that we have passed the shortest day, but that will not help you in the execution of your order. Now is the time to stimulate your efforts in the direction of photo-mechanical printing.

R. E.—*Pigeon Post Photographs.* You might, by chance, still be able to obtain them of the London Stereoscopic and Photographic Company, who had them on sale twenty years ago. Failing in this quarter, you must seek out MM. Dagron et Cie, or the publisher, M. Lahure, 9, Rue Fleurus, Paris.

E. N.—*Warm Water Washing.* This practice has been repeatedly advocated of late, and Professor W. K. Burton has specially urged its general adoption. By squeegeeing the prints at each change of water the time of washing may be still further reduced.

C. S.—*Erratum.* In the third line, for "professed" read *preferred.*

WOBURN.—*Standard Portfolios.* Enquire of Messrs. Slade Bros., Great Portland Street; or Messrs. Marion and Co., Soho Square, W.

PRINTER.—*Photo-Engraving and Collotype.* Mr. Wilkinson's book can be had of Messrs. England Brothers, 12, Charles Street, Notting Hill, W. (price 5s.). Ernst Lietze's work is published in New York, and the price is unknown to us; try Messrs. Kegan Paul, Trübner, and Co.

R. PARR (Barnsley).—*Salcombe Views.* You might enquire of Messrs. John Hawke and Sons, 8, George Street, Plymouth, or any other local photographer.

# THE PHOTOGRAPHIC NEWS.

VOL. XXXV. No. 1688.—*January* 9, 1891.

CONTENTS.



## YELLOW *VERSUS* ORANGE LIGHT IN THE DEVELOPING ROOM.

As the use of red light in the developing room with plates which are not orthochromatic may now be considered to be a mistake on the part of those who wish, for the benefit of their eyesight, to work in as bright a light as possible, the relative merits of yellow and orange light remain to be considered. The following table by Amédée Guillemin, which we published last week, at once throws much light on the question:—

| Colours. | Luminous Intensities. | Lines. |
|---|---|---|
| Extreme Red ... | Imperceptible ... | A |
| Red ... | 32 | B |
| Red ... | 94 | C |
| Orange | 640 | D |
| Yellow | 1,000 | |
| Green ... | 480 | E |
| Blue ... | 170 | F |
| Indigo... | 31 | G |
| Extreme Violet | 6 | H |

This table shows the relative luminosity of the spectrum where cut by the eight principal lines of Fraunhöfer. The maximum brightness is between D and E, nearer D, and distant from it about one-tenth of the total interval DE. The yellow, it will be seen, appears to the eye to be not very far from double as bright as the orange of the same spectrum, therefore orange is a colour to be avoided in developing room operations; but it is a far better colour to use than red.

In farther illustration of this principle, we reprint the diagram from the YEAR-BOOK showing the luminous intensity to the eye of the different parts of a diffraction spectrum, and it will be seen that the brightest rays are the yellow, between D and E, fig. 1. Guillemin probably used a spectrum produced by a prism or prisms. Anyhow, the falling off in luminous intensity is so great in the orange as compared with the yellow, that the former ought not to be used. We prefer a full sunflower yellow, not deep enough to be mistaken for orange, and to use a translucent screen.

Still, under certain conditions, light lemon yellow can be used with safety. One reason why what is called "canary medium" answers well in some hands is that the fabric is thick, and, in addition, may be used in more than one layer, so that the good translucency of the material adds to such safety as is given by the colour. By avoiding the use of too strong a light, by developing at a suitable distance from the screen, and by attending to the conditions we published last week, there is no difficulty in employing the canary fabric with safety; indeed, many photographers have for years used it with satisfaction.

A fundamental error running through much of the literature of the past, is the recommendation to put an unexposed plate in a slide with the shutter half drawn, then hold it in front of the developing lamp window, expose thereto for five minutes, and afterwards pour on the developer to see if it gives fog on

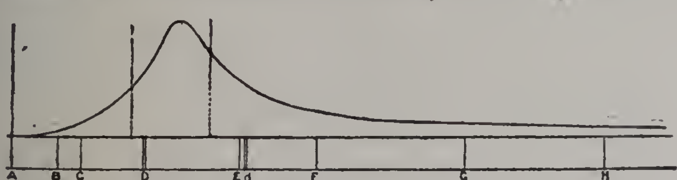



*Fig.* 1.

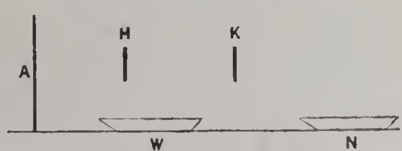



*Fig.* 2.

the exposed half. In actual work a plate is practically never so exposed, and should it thus give fog may yet do well for developing operations when the conditions are applied which we published last week.

For instance, let A, fig. 2, be the translucent front of the developing room lantern, and H a plate held vertically before it for five minutes, at a distance of nine inches, and suppose the plate to be then slightly fogged. Had it been held eighteen inches off, at K, probably it would not have been fogged, because the intensity of the light there is four times less. Again, it probably would not have been fogged had it been placed in the dish W, and covered with the developer, because the light falling on the horizontal plate would be less, and directly the developer was poured on, most of that light would not reach the plate at all, but be reflected from the surface of the liquid. A good way of working is to get the plate under the developer at the position N, and when the image is half out, bring the dish to the position W.

A light which slightly fogs the plate when the dish is close to the translucent screen is not necessarily objectionable, because the operator can then develop a little farther off, and has the satisfaction of knowing that he is using so nearly the strongest light possible, that working a few inches nearer to the coloured screen will give fog. The method of working of the old school leaves the operator in doubt whether some useful light, good for his eyes, has not been cut off by the screen.

Fogging of plates is commonly enough produced by the operator lifting the plate much too soon from the developing dish, and holding it close to the screen to try to see how the image looks by transmitted light. The full power of the light then acts directly upon unaltered bromide through the back of the plate. Care should be taken not to do this, and it is well that one of the windows of the lamp, not the one facing the developing dish, should be of two thicknesses of transparent, highly non-actinic glass, through which the naked flame can be seen; for it is easier to detect certain faults in sensitive films by looking through them at a flame rather than at an illuminated translucent screen.

## BACKGROUNDS AND ACCESSORIES.

The great attention which has, of late years, been paid to the artistic possibilities of photography has had the effect, among other good results, of revolutionising the furniture and general equipment of the photographic studio. What was considered correct in past days, and what well enough contented a not too critical public, can be seen by studying the pages of any old family portrait album, an exercise most beneficial to all workers in photography, chiefly, perhaps, as an object lesson in "what to avoid." A similar lesson can often be learnt by examining the contents of the show-cases of photographers in the unfashionable neighbourhoods of our large cities and towns, to which, like fashions in dress, the relics of past fashions in accessories and backgrounds have drifted. These are generally of the most preposterous nature, and it is as well that they are still extant, in order that they may serve as fearful warnings to the rising generation of photographers. The gorgeous columns and balustrades, the vases and fountains, may still be seen here, and are, no doubt, attractive enough to those who, if they do not dream of dwelling "in marble halls," like their friends to see their counterfeit presentments depicted amid the semblance of such surroundings. For the average 'Arry, when he wants his portrait taken, dons his Sunday best, and, "looking quite the gentleman," as he would express it, he must be "took" with genteel surroundings. These surroundings usually take the form of a table with a single *papier maché* curved leg, a Corinthian pillar cut in half, upon which he can carelessly lean, and over the edge of which he hangs a substantial hand, and a curtain which half hides a park-like landscape in the distance, which is separated from the model's boots by the aforesaid balustrade. But if we confine our enquiries to a higher rung of the social ladder, we still have ample evidence that early workers in photography paid very little attention to suitable surroundings to their portraits. In looking through any old album, we find that incongruities are the rule rather than the exception. Here, for instance, is the portrait of a buxom matron, her form enveloped in a rich silk dress studded with an enormous brooch containing a portrait, with a long chain, which has been picked out in gold paint by the artist so as to make it as aggressive as possible. She is as common-place in appearance as any mortal is possible to be, but she sits in a chair which, apparently, is a bad copy of a sixteenth century Italian model. Why such a chair in such company? one naturally asks. But this is not all, for by her side there is a kind of cabinet or pedestal—it is difficult to say which—with an ornamentally carved fluted panel, which is clearly English, and of a period which dates a century earlier than the chair. The pedestal, or whatever it is, has, at first glance, no kind of *raison d'etre*, until closer inspection shows us that it holds up the bulging fold of a curtain hung from nothing. ... ..

The idea in introducing these monstrosities into a picture was evidently born of ignorance, and the custom need not excite surprise when it is remembered how, in the early days of collodion, all sorts and conditions of men were attracted to photography as to a gold mine. So long as they could learn how to coat a plate with the viscid fluid and dip it into a bath, they were qualified, so they thought, to undertake portraiture. The public whom they had to deal with in those days was as ignorant as themselves, and between them art and photography were kept as far apart as the poles. So it became the custom to combine as many things as possible in the picture. It did not matter whether they were incongruous or not; it was looked upon as the right thing to do, and it was done. Besides, the demand quickly caused small factories to be established, where photographic accessories of fearful shapes were turned out by the gross, and were quickly sold to those who were reaping a golden harvest from their silver baths. The philosopher's stone had at last been discovered, and everyone was happy.

With the foundation of schools of art all over the country, and the appearance of many books which deal with the necessity of art education, a better state of things has arisen. Photographers now know better than to fill in their pictures with gimcrack imitations of gorgeous pieces of furniture, and aim at simple effects of light and shade rather than elaborate detail. Backgrounds and accessories are still used, and when rightly used are most effective, but they are of a far finer type than those of which we have been speaking. Many of our readers must have seen, at recent exhibitions of photographic apparatus, the beautifully modelled cabinets, old iron and stone work, and fireplaces which, compounded of canvas and plaster, and touched up in monochrome by an artistic hand, are so effective when photographed. There is nothing staringly offensive or aggressive about these things—no hard high lights or deep shadows—so that they retire, as it were, from competition with the living figure which is placed in front. So it is with the modern well-painted backgrounds which are now purchasable. The designs have nothing staring about them, and are rather suggestive of the presence of things than assertive of their existence. In this way a door, a window, or a mass of trees may give attraction to a picture which, without them, would be cold and bare. In backgrounds and accessories the art of portraiture has certainly progressed, and good workers now well understand that it is a part of their business which must not be neglected.

## OUR BROTHER THE CRAB.

### [A Photographic Revelation.]

BY JAMES MEW.

Years ago, when the lines dividing the wrong and the right use of a detective camera were somewhat blurred and indistinct, a suggestion was made touching the possible publication of a volume of incidents in court, political, and social life, compiled by the agency of this ingenious instrument for the delectation of the fashionable world. It was urged—and so far, indeed, with truth—that the most interesting records of contemporary events, such as those well known of Pepys and Hutchinson, of Clarendon and Bishop Burnet, of the Duc de Saint Simon and Philippe de Comines, which have appeared in letterpress only, would pale their lambent and comparatively ineffectual fires before the rising day-star of a book illustrated by photographic aid, with the exact attitudes and appearances of the important personages it describes.

If you will take at random a page of "Greville's Memoirs," the value of this suggestion may be rendered more clear. "I went," he says, April 8th, 1832, "the other night to see Sheridan Knowles' new play, *The Hunchback*. Very good, and a great success. Miss Fanny Kemble acted really well; for the first time, in my opinion, great acting. I have not seen anything since Mrs. Siddons (and perhaps Miss O'Neill) so good." How much of life could be put into this simple statement by a photographic accompaniment, showing to our eyes Miss O'Neill, Mrs. Siddons, and Fanny Kemble as they appeared to his, may be safely left to the estimate of any intelligent reader. The enterprising amateur photographer who will trouble himself to keep a diary, political or social, religious or scientific, and to illustrate it with judgment, and taste, and skill by the aid of his camera, will have no reason hereafter to regret, in this respect, a waste of labour, of money, or of time. A photographic Greville would, unless unequal fates opposed his way, be equally sure of fame and fortune.

But it is with a photographer of animal portraits that the present article is immediately concerned, and for him the time is now ripe. A knot has been tied worthy the intervention of such a god, and all appliances are his to boot. Stupendous chemical compounds await his beck and call.

There was an old woman, so runs a tale, of which, since we cannot all know all things, some of the readers of the Photographic News may be yet wholly unacquainted, who, on being asked her opinion of a new preacher, expressed her dissatisfaction with the clean shaven youth who had, with due dignity of deliberate movement, ascended for the first time the steps leading to the pulpit of her small village church, and expounded therein the way of salvation to the patient congregation below. Being asked for what reason she held the young man in little esteem, and why she preferred her late pastor to her present, she replied that the latter had never once, in the whole course of his sermon, mentioned that blessed word "Mesopotamia," which was so familiarly frequent in the sermons of his predecessor, and had on so many occasions given her spiritual consolation of no little strength in her hour of trouble. As this blessed word acted upon that old woman in the production of ghostly satisfaction and internal peace, so may some other words lately begotten of him who was the father of eikonogen compel reverence in the bird-witted folk who sit in the seat of the scorners to deliver judgments on photography all day long. Hardy, indeed, and fortified by a shield of triple brass, must be the soul of that person who would dare to speak lightly—or indeed, to speak at all, in public—of those new compounds by which a negative may be developed quickly or slowly, as the operator wills; of dioxynaphtalindisulphite, and its twin brother naphtohydrochinonmonosulphite. If the use of these agents is at all proportionate to the greatness of their names, our photographer of animal portraits may commence the business which will be suggested to him further on with supreme confidence in a successful result.

Mr. Ruskin and others seem to think—it is difficult to speak precisely in this matter—that a landscape, however fair, ceases to be so when photographed, unless figures of humanity are introduced. "Where humanity is not, and was not, the best natural beauty is more than vain." Such is the dictum of the great master. A critic gives as an instance of opposition to this sentence the celebrated Taj Mahal, at Agra. This instance hardly complies with Mr. Ruskin's conditions. Humanity certainly was where this building is; and the chief feature in the picture of the Taj would not be natural in the ordinary sense of that word, but artificial. Neither the instance of a mountain peak, nor of a rolling sea, comes necessarily under Mr. Ruskin's rule, for humanity may have been on the top of both. Probably the idea of the artistic philosopher is, when simply expressed, little more than this, that photographs of wild nature are idle without human figures. But to assert this is to assert a great deal. The position may in some measure claim Milton's support. More, we know from that poet, than the sight of vernal bloom or summer's rose, and more than any vision of flocks or herds, is the sight of the human face divine. To behold this in storm or sunshine, lurid with the scowl of envy, hatred, malice, and all uncharitableness, or brightly beaming with good humour, amiability, generosity, and love, is that after which the world of humanity mostly hankers.

Many of our noted novelists have given in words a vivid portrait of the darker passions of mankind. It remains for the photographer to give a precise pictorial facsimile of the effect of these evil passions on the face. Unfortunately, it is difficult to find a man, and still more difficult to find a woman, who would consent to have a likeness taken of features contorted by the rude action of these harpies of the mind. Fortunately, on the other hand, a substitute is to be found displaying a remarkable resemblance of the ugliness they produce. Dr. Emerson has introduced to us the crab.

He has also introduced the octopus. Both these beasts remind him much of his fellow-men. They are, he tells us, fit company, these terrible monsters—the octopus and the crab to wit—and it is their "human-like actions that make them so loathsome." Speaking of a crab which had, by a ruse of successful cunning and Machiavellian sagacity, obtained a portion of a bloater's head, he says that after beating a hasty retreat to the water's edge, he—the crab, not the doctor—"crouched down and began to tear and eat it in his repulsive and even human manner." Another crab, occupied with a shrimp, clutched it, we are told, with greed—the greed of the miser. A full-grown ghoul came and sat down on the ooze by Dr. Emerson's side, just like the big spider, to compare small things with great, by the side of Miss Muffet. But the doctor, far from being frightened away by his assessor, was "fascinated by his bestial actions, so human were they in movement and sentiment."

It is clear, then, that by the humble example of the crab we may hold up a mirror to human nature, and, without the necessity of wounding any feelings of delicacy or self-love in our sitters or squatters, may compose a gallery of faces animated by the various demons of passion, esthetically entertaining, if not morally useful. We have already seen that the attitude of the crab may express greed. The "cold, cruel, chinless, triangular face, with wide-parted eyes and hairy mandibles, without one ray of light to illumine the dreadful countenance," may also convey to an attentive observer the expression of "brutal lust." This power of reproducing human passion is probably an exclusive endowment of the crab. Dr. Emerson has, indeed, also mentioned cursorily the octopus; but, in his illustrations, the crustacean reigns supreme.

No other animal, from the tiger to the titmouse, participates in this remarkable gift with the crab. No horse—whatever may be said of an ass—has, in all probability, ever reminded Edward Muybridge of a human creature by any similarity in the expression of evil. Nor, in a case where we might well look for it, has Ottomar Anschütz, it is confidently believed, ever yet confided to the public his detection of any resemblance in facial wickedness in the monkey and in the man. Therefore, let the photographer of animals confine himself to the portraiture of the crab. He will learn to detect, with unerring constancy, that dreadful ugliness of likeness which, by its very likeness, is made more ugly—as it adds deformity, according to Bacon, to an ape to be so like a man—an ugliness which is not noticed by the casual observer. He will become an artist in the highest and best sense of that much-abused appellation. He will by degrees attain that subtle feeling of diversities of aspect—born in some few highly-favoured men, but in the vast majority the slow result of culture and refinement—which enables the operator to produce what are commonly known as portrait effects. Every crab must constitute for him an all-important study. He must cultivate the acquaintance of every genus, of every species, of every family, of every individual of the *brachyura*, or short tailed-division of decapod crustaceans.

The *Carcinus Mœnas*, or common shore crab, must be his familiar friend; but the *Cancer Pagurus*, or edible crab, which is probably—though the matter is darkened by much doubt—the crab of which the physiognomy is in Dr. Emerson's eyes so full of human interest, must be to our photographer, in no secondary sense, a brother. With him there must be nothing of that restraint which usually exists between strangers in the first dawning of social intercourse; nor must too great familiarity, on the other hand, breed in either contempt. To say that the photographer must be extremely careful about the pose of his client; that, if aught is wrong, he must take means to secure another sitting; that it is his duty to see the sitter's good and bad points, to make the most of the latter, and, by adroit retouchings, to smooth away the former, are pieces of advice so trite that it almost demands an apology to repeat them.

After some time, and by means of much patient study, our photographer may open a museum of portraits representing, in their most repulsive forms, the seven cardinal sins. The passions of lust and avarice, as they are reflected in these hard-shelled mirrors, have been already shown to us in words by Dr. Emerson in the case, probably, of the *Cancer Pagurus*. In other invertebrates of the same genus other human failings may be found. Pride may appear in a carefully executed cabinet of the *Stenorhynchus tenuirostris;* envy in a carte of the devil-crab or *Portunus puber*. The hermit crab might furnish an interesting picture of sloth; the *Cardisoma Carnifex*, who in the West Indies enjoys his grave and gruesome banquet in a burial ground, of gluttony; and the *Porcellana platychelys*—who, moved by his passion, voluntarily resigns his limbs in instalments sooner than quit the field of combat—of anger.

Photographs of this kind, if exposed in the shop windows of our streets, would counterbalance, in some degree, the present disconcerting and vexatious preponderance of the good and the excellent, the brave, the bountiful, and the beauteous, which appears in the portraits of our boxers, bishops, and ballet-girls, and from the mixture of opposites the mind of the spectator might attain neutral tranquility. The equable state of soul arising from a contemplation of photographic pictures of moral extremes is as desirable as that state which was the object of the wise prayer of Agur, the son of Jakeh: "Give me neither poverty nor riches; feed me with food convenient for me."

---

London and Provincial Photographic Association.—New quarters, the Champion Hotel, Aldersgate Street. Thursday, January 15th, adjourned discussion on "Developers."

Photography in Newcastle.—The following advertisement appears in *The Newcastle Daily Chronicle* of January 5th last:—"Central Exchange Art Gallery, Newcastle-on-Tyne. Now on view for a short period only, the Loudon Camera Club collection of Mr. Lyddell Sawyer's principal photographic studies. Old Newcastle places aud faces, river scenes, marine subjects, instantaneous effects, genre studies, &c. Pronounced to be photographic *chef d'œuvres* by all the London press. Awarded thirty-two medals aud diplomas at all the promiuent exhibitions of the day."

Clubs, societies, and newspapers whose subscribers are iu arrears with their payments, might adopt the following American specimen of gentle reminder: "Lives of poor men oft remiud us, houest toil don't stand a chance; more we work we leave behind us bigger patches on our pants. On our pants, once new and glossy, now are marks of different hue; *all because subscribers linger, and won't pay up what is due.* Then let all be up and doing; send in your mite be it so small, or when the snows of winter strike us, we shall have uo pants at all."

## NOTES ON PORTRAITURE.

### No. II.

BY H. P. ROBINSON.

I hope I shall not get angry in this paper. There are certain things I feel strongly, and may perhaps state with too much force.

In photographic portraiture we are running in a groove, and little effort is made to get out of it. This is, after all, perhaps not to be wondered at when we consider the influence that fashion exercises in almost every detail of our lives. It is therefore of little use to abuse professional photographers for not striking out into a fresh path; they have to get a living, and must supply the demand of their customers. At present fashion demands that every face shall be made to look like polished marble, regardless of life, likeness, expression, texture, or Nature, "the same with intent to deceive." But such deception deceives nobody, for nobody now believes in photographic portraits as likenesses. Such attempt at deception is not far removed from painting the natural face and dyeing the hair, and it does not want an expert to detect the fraud at once. Deception of this kind, therefore, does not answer the end which it had in view; it deceives nobody but the vain victim who thinks that the marble gloss substitute for the bloom of youth is natural to her. Education in art has not advanced far enough to enable these silly people to see that the unnatural retouching of to-day destroys photographs as works of art, and renders them valueless as documentary facts. This excessive polishing is acting an untruth, and should be held in the same detestation as falsehood with the tongue. Even if it were successful, it is well to remember the wise aphorism that tells us that "those who conceal their age do not conceal their folly." Not that I would abolish retouching; for in judicious hands it is a valuable aid to a better representation of nature; but I would have no mercy on the retoucher until he had educated himself into a frame of mind that made him look aghast at his present productions. Of course I speak only of the ignorant retouchers, not more, perhaps, than nine out of every ten, for I know there are some who understand the anatomy of the face—how to respect it, what to do with it, how far to go, and when to let it alone.

Then, notwithstanding what I have said about photographers having to obey their patrons, I cannot but think that some effort after improvement, or if not improvement at least some alteration tending towards improvement, might be made in the styles of portraits. For instance, the ordinary cabinet vignette head is undoubtedly a good style of portrait, very easy to do, though not always well done; very effective; a very good means of eliminating difficulties that may arise from the possible awkwardness of the figure, and for shirking unmanageable composition. But we have had thirty years of it; we have produced them by the million, and they are beginning to be a trifle monotonous. Cannot we add a background? It is true we are very bad at backgrounds, but cannot we improve? We usually make our portraits upright: cannot we make them horizontal, for a change? We usually make our sitters, in a full length, appear to stand on their feet, or, more often and awkwardly, on their toes: cannot we make them stand on their heads? This latter suggestion is not, perhaps, "within the limits of civilization," but it partly suggests what I mean. In short, cannot we get up a revolution? Photographers ought, by this time, to be sufficiently exasperated with the monotony of their work to be ready for anything—even to the extreme extent of putting their portraits out of focus.

It is now time, perhaps, to be a little more serious. I recognise that my reader has every excuse here for asking the question, "What do you recommend? Suggest something, or for ever hold your peace." I cannot say that I can comply with the request. The something new must be evolved by the photographer himself.

He must try to be individual, and not rely on imitation. I know there is great difficulty; I know that the mass of humanity will not make pictures as well as portraits. As I write I receive a bundle of photographs from a photographer whose business is in a smoky town in the north of England. He thinks his lighting is in fault, or his manipulation. Well, they are. But I sorrowfully confess that very little could be done to improve his portraits of such sitters. It is as well to let them have their half-a-crown's worth and go away satisfied, which, perhaps, they would not do with anything more delicate or better, anything they were not accustomed to. There were some heads among them that would have made good pictures if properly managed, but not portraits. Even on these cheap cartes the retouching demon had left his scratches; the old coal miner had lost his wrinkles, and the hallilujah lass smirked under the added grace of puffiness.

I have urged the photographer to be individual and strike out lines for himself, yet there is something to be said for the other side—combination; or rather, they should be individual, and yet combine. They may have their own styles and sizes in their general work, and yet combine to push one kind of picture; to make a certain class of picture so fashionable—I am sorry to have to use the dreadful word—that it must be had regardless of trouble to the sitter, or expense.

Nothing ever increased the business of the photographer as the carte-de-visite mania. Men who were in the depths of despair suddenly found themselves in the height of prosperity. This continued for some years, until the existence of a good thing induced competition, brought down prices, and vulgarised the style. Perhaps nothing did so much to spoil the business as the attempt to give too much for the money; not so much the giving of a large number for the price charged, as the cramming of the largest possible figure into the small space. The original carte represented a full-length figure justly proportioned to the space; then half-lengths and head vignettes were introduced for the purpose of giving a more visible head, and the style got confused. It went on till the heads were made so large that, when put in an album, the end of the nose of a profile and the back of the head were hidden by the opening, and in full-lengths the head touched the top of the mount, and the feet the bottom, so that all proportion was lost, and the sitters looked like a race of giants. If anything as popular should ever be introduced to the fortunate photographer, it will certainly be something very simple. When it comes, it would be well to let well alone, and not improve it off the face of the earth.

I cannot help thinking that for general purposes something more sketchy than the ordinary heavy looking portrait would find favour with the public. For this the platinum processes seem to offer great advantages. A light-figured background may be so vignetted in a platinum print as to suggest clever sketching with a lead pencil, and yet be truly photographic. It only requires to mix a few platinum prints with the ordinary pink albumenized paper horrors to show how refined the former are, and how utterly vulgar the latter. Why is this pink paper so universally used for business purposes, and so seldom for exhibition? In the last Pall Mall Exhibition the hangers had, in mercy, to remove the pink prints as far as possible from the platinums. There was reason in the light greyish blue tint first applied to albumenised paper; it neutralised the tendency to a sickly yellow to which this paper was rather prone; but it succumbed to the law of decadence which seems to insist that all good things shall degenerate, either by adulteration, or a pandering to vulgar taste. And so the pearly beauty of the first tinted papers has degenerated down to pink and mauve, which colours are gradually becoming stronger, and are the ugliest in the spectrum—no, not in the spectrum (all colours are pure there), but that ever came out of an aniline dye manufactory.

## INTERIOR PHOTOGRAPHY.

BY LIEUTENANT C. E. GLADSTONE, R.N.

I trust that I may not be thought too egotistical in the remarks I propose to make to-night on the subject of interior photography, but it is difficult to know what to say on such a subject beyond giving the results of one's own experience, and if a good deal of practice qualifies one to speak on any subject, perhaps I may claim to be so qualified, as I have worked at most of the English cathedrals, spending several days at each, besides a good many foreign ones, and many churches and other interiors.

Whether interior photography is an agreeable pursuit or not is mainly a question, I imagine, firstly, of the temperament of the individual, and secondly, of whether he be acquainted with architecture.

Some photographers find their greatest happiness in introducing human figures into their pictures, but, for my own part, if there is one thing more than another I hate whilst photographing, it is my fellow man and brother. I greatly admire these workers for the trouble and pains they take in thinking out and arranging their compositions —one must admire good men struggling with adversity— but I have no desire to imitate them, and I cannot help thinking that their results might be more agreeable, and possibly more artistic, if they substituted for the human form some accomplished lay figures.

To one with these possibly abnormal ideas interior photography has a natural charm. I know that the human animal can cause me no inconvenience. He may walk where he will, plant himself in front of the camera, or do just what he pleases, and, given a good long exposure, the plate remains profoundly indifferent to his presence.

On the other hand, I do not suppose that one who was not interested in architectural matters would find much pleasure in making a practice of interior photography. The exposures are necessarily long in most cases, and if one has nothing to do in the meantime, the inclination is irresistible to cut the exposure short, with the almost certain result of spoiling the negative.

If, however, one is interested in architecture—interested in trying to solve the problems that meet one at every turn in an old building—then the time passes all too quickly, and there is no desire to reduce the exposure, the negative benefiting greatly thereby, for, as a general rule, it may be taken that it is a matter of difficulty to over-expose an interior, and in the rare cases where it does occur the error may usually be corrected in development, whereas with under-exposure, no subsequent operations can remedy the defect.

I say that the exposures are generally long, and perhaps I ought to preface my remarks by saying that they refer to work done with a 12 by 10 camera, and therefore with lenses of some focal length. With small cameras, and lenses of shorter focal length, the exposures become considerably shorter. A month or two ago there appeared in the photographic journals a paper by Mr. Debenham, wherein he showed that the definition of out-of-focus planes did not depend on the relation between the diameter of the stop and the focal length of the lens, *i.e.*, on the intensity ratio, but that it depended on the absolute diameter of the stop itself, and on that alone. From this it follows that if we have two lenses, one double the focal length of the other, and if we find that, in order to obtain the necessary amount of definition with the short focus lens we have to use a stop of a quarter of an inch in diameter, then we shall also have to use a stop of a quarter of an inch diameter with the long-focus lens in order to obtain the same amount of definition, the result being that the exposure with the long-focus lens will be four times that of the other. Another reason for long exposure is that it is nearly always necessary to use the rising front and swing back, the effect of the latter being to throw the top and bottom of the picture completely out of focus. Their use cannot be avoided, as otherwise the picture is spoilt by too much foreground, and their effect on the definition of the picture can only be neutralised by the use of a small stop. I very soon found out that the amount of rising front and swing back, as supplied by the maker, were quite insufficient for interior work. Fortunately, it was an easy matter to alter the fittings so as to largely increase the amount of each obtainable, and occasions not unfrequently arise when it is necessary to use this increased amount to its full extent.

It is necessary, when using the rising front with W. A. lenses, to make sure that the bottom corners of the picture are not cut off, and as it is a difficult matter in many cases to see whether these lower corners are cut off or not, owing to the darkness of the image on the ground glass, it is advisable to try beforehand and see how much the rising front can be raised with safety with different lenses. By pointing the camera to the sky, the ground glass is well illuminated, and on raising the front it can be seen in a moment when the corners begin to get dark; the position of the front should then be noted. Providence has fortunately arranged matters so that the more one tilts the camera, the more one can raise the front, so that in extreme cases it will be found, with the great majority of cameras, that the rising front can be used to its full extent without cutting off the corners.

As regards the actual exposures that are necessary for interior work, I do not propose to say anything; the variations in exposure being so enormous that it is simply useless attempting to lay down any rules on the subject. I have here two prints which happen to be the longest and shortest exposures I ever gave for interiors. The actual exposure for the long one was four hours, but reducing both exposures, for the purposes of comparison, to what would have been given if an intensity ratio of $f/9$ had been used, the exposures then become thirty minutes and ten seconds, *i.e.*, one plate received an exposure of 180 times the other.

I may mention one point in connection with long exposures that I have occasionally noticed, but which may possibly be more common than I imagine. It is that the images of bright windows are sometimes visible on the film before development, the image appearing as a grey patch on a white ground.

As a general rule, sunlight shining direct on the subject is bad, though occasionally excellent effects may be obtained this way. These effects, however, in my experience are not under the photographer's control, and the more usual result is that patches of abnormal density appear on the negative which produce on the print white patches devoid of detail. Of sunlight, provided it be not directly on the subject, one cannot have too much. It increases the amount of reflected light, and consequently reduces the blackness of the shadows, and tends to prevent those violent contrasts which are so common in interiors.

At one time I was troubled by occasional patches of fog on the negative, which always appeared in the vicinity of a window and close to the edge of the plate, and the cause of which was not discoverable for some time. I eventually traced it to the image of a bright window, half of which was included in the picture, and half of which was outside the picture, being reflected from the square edge of the woodwork of the camera surrounding the plate on to the plate itself. The square edge being bevelled off so as to prevent reflected light from it falling on to the place, effectually disposed of the difficulty.

With reference to the use of wide-angle lenses for interior work, two things, I take it, are certain; firstly, that they should be absolutely avoided for general work, and secondly, that they are absolutely necessary on occasion. Many amateurs have only two lenses, one of which may be regarded as a "general purposes" lens of moderately long focal length, the other being probably a wide angle of very pronounced type. If an amateur so equipped commence interior work, he will very speedily find that, in many cases, his long-focus lens will not take in enough, and, having only one other lens, he is compelled to use that, with the result that he gets most unpleasing and exaggerated perspective in his pictures. For this reason, a series of lenses of different focal lengths is invaluable, and enables one to avoid using the most W.A. ones, except on very special occasions. A series of lenses is also a necessity if any large amount of work is to be done. Everyone knows how the composition of any subject changes by simply moving the point of view a few yards, and in interior photography, owing to the confined positions, and the fact that the different planes of the subject are at such varying distances from the point of view, this fact becomes of the greatest importance. A foot or two either way will so alter the composition of a picture as practically to make it an entirely different one. It is, therefore, necessary to be able to select the exact spot where you wish to place your camera, and then to have a lens which will, from that spot, include just as much as you want to get in your picture. The widest angle lens I use is a nine-inch one, which gives an angle of sixty-seven degrees on a twelve-inch plate. This angle, though a very moderate one compared to that included by many wide-angle lenses in common use, undoubtedly gives, under certain circumstances, unpleasing perspective, and it is one that I only use on exceptional occasions. The angle that it includes is, I think, the extreme limit that should be employed, and a view that could not be taken, except by using a still wider angle lens, would give such violent perspective that it would be better not to take it at all.

There is a difference in the effect on the eye of the perspective when using a wide-angle lens, according to whether the picture is an oblong or an upright one. In the former case, especially in such cases as a nave or choir, where a row of arches is to be found on either side of the picture, the tendency of the lens to cause unpleasant perspective is greatly increased, whilst, in the latter case, the exaggeration, though produced by precisely the same lens, does not appear to be so noticeable to the eye. This would appear to be recognised by artists, as, from an inspection of etchings or engravings of interiors, it will be seen that care is always taken with an oblong picture to avoid anything approaching to exaggerated perspective, whilst with upright ones the angle of view included is frequently so great that it could only be obtained in photography by the use of an abnormally wide-angle lens.

I have brought here to show you a levelling tripod top, which I have found for interior work to be quite the most useful piece of apparatus in my possession. Everyone knows the trouble and loss of time caused by the necessity of accurately levelling the camera for interiors, and the shifts that have to be gone to in certain cases where it is difficult to find a firm footing for the tripod legs. With this top levelling becomes a matter of a few seconds, and the legs, having been once fixed in convenient resting places, need not be touched again. On smooth-tiled floors, and in confined situations where it is a matter of considerable difficulty to find any place at all for the tripod legs, this is a point of considerable importance. For getting the ground glass vertical and horizontal, I have found nothing to equal a circular spirit level. The method of ruling lines on the ground glass, and then getting the subject vertical by means of these, is one that does not commend itself to me. It is a method that can only be used with comfort when the subject is very well lit, and the lens is one of large aperture. With dark subjects, and with lenses working at $f/16$ or $f/20$ at their full aperture, the image on the ground glass becomes so dark as to make the method a most tedious one, and, on occasion, the subject is shrouded in such obscurity that it simply becomes a physical impossibility to see the lines on the glass at all; lastly, in all old buildings, the pillars, more frequently than not, are not vertical themselves, and are, consequently, most unsafe guides to go by.

I have also here a view meter which has the advantage of enabling you to see your picture with all the surrounding objects cut off, thereby enabling you to get a much better idea of the composition; and it also enables you, by altering the position of the draw-tube, to ascertain exactly what lens you will want to use to include any given view. The most practical advantage of this is that, whilst your camera is taking one view, you are able, at your leisure, to study the composition of the next one you intend to take, and select with the greatest care the exact spot from which to take it.

Development is a subject which I propose to treat like exposures, and say nothing about. It is just as necessary to vary the proportions of your developer for interiors as for anything else. This much I may say, though, that I suppose everyone has what he regards as his normal developer for ordinary out-door work, and which he varies as occasion requires. If, then, you take this normal developer, halve the pyro, and double the water, you will have what you may regard as a very fair normal developer for interiors; not a developer which will develop every interior you take equally well, but one which will require to be constantly varied to suit the subject, and which may, nevertheless, be looked upon as your normal developer. It is some years since I used plates for any kind of work, but to those who do use them I would say, never take an interior without backing the plate. There are many methods of backing, and it will be enough if I mention that, for my part, I prefer black varnish. This, when dry, is always hard and clean, and, before development, can be removed with the greatest ease with cotton-wool and turpentine. It is only necessary to clear away the central portion on the plate, leaving that round the edges to wait until after fixing.

One word more as to the time of year for interior work. Some time ago I did a good deal of work late in October, and, although the weather was exceptionally bright, I found, on development, that most of the films were under-exposed, more especially those taken early in the morning and late in the afternoon. The explanation is, I think, that the light, though bright enough to the eye, is nevertheless weak, the reflected light inside the the buildings is feeble, and, as a consequence, the shadows are always black, and the contrast between them and the high-lights much greater than in summer, when a flood of light is reflected from every part of the interior. Anyway, the practical result of my failures was that I decided that, when the sun set at six o'clock, it was time to stop taking interiors.—*Camera Club Journal.*

## A BURST PRESSURE GAUGE.

The other day an action was tried which is of great interest to all lanternists, for it arose out of the bursting of a pressure gauge whilst *in situ* on an oxygen gas cylinder. The accident unfortunately resulted in the operator losing the sight of one eye, and the sight of the other has since been endangered through what doctors term "sympathetic action." The bursting was not due to any explosive mixture of gases, but simply and solely to the pressure exerted upon the inner tube of the gauge by the compressed gas. The gauge had been tested three or four times previously to being sent out, and the defendants, Brin's Oxygen Company, pleaded that this was the case. They further pleaded that they were not the makers of the gauge, but that it was an article generally sold as a pressure gauge, and also that the contract between them and the plaintiff was for the supply of a guage in general, and not for a gauge for a specific purpose. In the end the plaintiff gained the action, and, by previous arrangement, received from the defendants £325 damages.

There is always, unfortunately, a suspicion, when any vessel constructed to bear a great pressure is said to have been tested to an extent far beyond that which it will normally be called upon to bear, that the test itself may possibly have weakened its walls, and caused a strain which may at some future time bring about disaster. This may have been the case in the present instance, or the accident may, perhaps, be accounted for by some flaw in the metal tube which forms the main part of a pressure gauge. But it is difficult to trace the exact cause of the disaster, and we can only surmise that it may have been due to one of the circumstances suggested. We can, however, offer a hint to the makers or owners of these gauges, whereby danger from a ruptured tube would be obviated.

It is assumed that we are writing of the common pressure gauge made with a strong brass casing, and containing a *Berdun* tube. Should this tube burst, the brass case immediately becomes filled with gas, and the glass front, being the weakest part of the structure, is forced out, and its fragments deal destruction around, as in the unfortunate case already cited. We have before heard of a glass being smashed in this way, but luckily with no evil results to the manipulator, and whatever be the actual cause, it is evidently an accident that may happen to any one using a gauge of this description. We suggest, as a preventive of injury from such an occurrence, that each gauge should be provided with a safety valve. This might take the form of an opening in the metal case, or the said case might be made of brass perforated in an ornamental style. The gas would then, in case of accident, find a ready means of escape on every side, and the glass front would remain intact. Until such a plan be adopted it would be as well if all users of such gauges were to pursue the course which we have always followed, of turning the face of the gauge away from us when turning on the gas valve. The turning of the valve should, moreover, be quite gradual, so as not to put any sudden strain upon the gauge.

The same pressure gauge may be used for both hydrogen and oxygen bottles; but as it is now the custom—a custom, by the way, which is much to be commended—to furnish the former with a left-hand thread to its screw nozzle, a left-hand threaded adapter will be necessary before the gauge can be attached to that bottle. The section of the Berdun tube is so small that there is really no danger from explosion if the two gases should get mixed within it; but, practically, the time occupied in moving the gauge from one cylinder to the other will give ample opportunity for it to get clear from any residue. The junction points between gauge and cylinders should never be oiled. A case of ignition of gas is on record which was traced to the heat caused by working a metal flange against an oily leather washer.

South London Photographic Society.—At the meeting on January 2nd, at Hanover Hall, Peckham, Mr. Howson gave a demonstration of lantern plates. The next meeting will be on January 16th, when Mr. Warnerke will give a demonstration on "Mechanical Printing as Applied to Photography."

Society of Arts.—The following are the papers to be read at the meetings of the Society of Arts after the Christmas recess:—J. F. Green, "Steam Lifeboats"; A. G. Green, C. F. Cross, and E. J. Bevan, "Photography in Aniline Colours"; Carmichael Thomas, "Illustrated Journalism"; T. Emmerson Dowson, "Decimal Coinage, Weights, and Measures"; Sir Roper Lethbridge, M.P., "The Proposed Irish Channel Tunnel"; Wm. Topley, F.R.S., "The Sources of Petroleum"; Colonel Sir Charles Wilson, K.C.B., K.C.M.G., F.R.S., "Methods and Processes of the Ordnance Survey"; E. J. Ravenstein, "Lands available for Colonisation"; Prof. J. J. Hummell, "Fast and Fugitive Dyes"; William Robinson, "The Use of Petroleum in Prime Motors"; H. Newman Lawrence and Arthur Harries, M.D., "Electricity in relation to the Human Body"; J. Harrison Carter, "Milling Machinery"; F. H. Cheeswright, "Breakwaters." The next series of Cantor Lectures will be by Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." The course of three lectures will commence January 26th.

## THE CAMERA AND ITS VARIOUS MOTIONS.

BY PROFESSOR W. K. BURTON, C.E.

CHAPTER IV.—THE TRIPOD-STAND, TURNTABLES, ETC.

In spite of the great amount of ingenuity that has been spent on camera stands, I think it is generally felt that the ideal stand has yet to be invented, or perhaps that it is impossible to fulfil all the qualities demanded. A few of these are strength, rigidity, lightness, portability, great height, accompanied with the capacity to shorten each of the *three* legs independently, capability of being instantly erected, and durability—a nice little list for the enterprising inventor!

It would be out of the question to attempt to enumerate, much less to describe, all the various tripods that have been designed with a view to fulfilling as many of the conditions as possible, and all succeeding more *or less*. Only a few words on the several conditions can be allowed.

As regards strength and rigidity, it should always be remembered that they are not, by any means, the same thing. To take a definite example: There has probably never been a stand invented that combined so much rigidity with lightness as the "Alpen Stock" stand, invented some years ago by Mr. George Smith. So stiff was this that, although intended only for a small camera, I used the stand for a somewhat heavy 12 by 10. The stand was rigid enough; in fact, it was more rigid than any stand that I have used since, and did very well till an attempt was made to lift about the camera with it, when it simply collapsed! It is fair here to remind the reader that the stand was not intended for a heavy camera. Lightness is compatible with stiffness, but not, apparently, with strength. If one has a heavy camera he must submit to a heavy stand; at least, if he wants to be able to pull about the camera, already erected, with any degree of ease.

It is *almost* impossible to have a really stiff stand with a very small top; and, moreover, it is an advantage, in every case, to have a comparatively large top, as this increases greatly the stiffness of the base-board, a thing of great importance in the case of some of the lighter makes of modern cameras.

Lack of rigidity in the stand itself should not be confused with "shakiness" of the camera itself on the top of the stand. This latter fault is a very general one, and especially in the case of stands with wooden tops or triangles. It arises, of course, from either convexness or springing of either the top of the stand or the base-board of the camera. It may be useful to know that it may always be cured by fixing the leather pads on the camera top, so that the camera will actually rest on three points. I illustrate the way in which this may be done in the case of a wooden triangle and a metal tripod top. In each case A A A are small pads of leather.

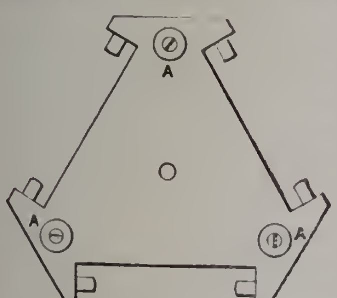



*Fig.* 10.

It should be understood that more rigidity is given by *three* pads than by four or any other number, and much more than by covering the tripod top altogether with leather. The pads may be fixed with screws, screwed down till the heads have sunk into the leather.

One word in connection with the use of a tripod-head with the three pads just described. Caution must be used in tightening the screw, otherwise the base-board may be split.

*Turntables.*—The turntable, as applied to cameras, was one of the improvements first popularised by McKellen. The arrangement is illustrated here. It may be said to consist of a turned circular top revolving in a bored ring. It gives great steadiness, and the camera may be clamped tightly in any position by a screw.

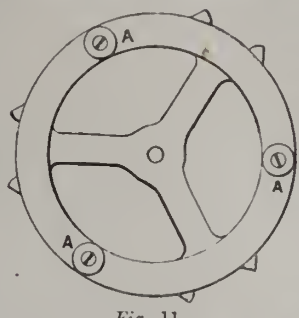



*Fig.* 11.

*Telescopic Metal Stands, Walking-Stick Stands, &c.*—I have not had much experience of these, but I know that there are several forms of them that are light and convenient, and that are stiff enough for very small cameras.

---

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.—The Society of Amateur Photographers of New York is incorporated under the laws of the State of New York for the cultivation and promotion of the science and art of photography. In carrying out these objects, the Society has provided itself with convenient quarters, consisting of a club room, well supplied with photographic literature, and all the leading periodicals of this country and Europe; commodious dark rooms fully supplied with all necessary utensils and chemicals, and convenient lockers for the storing of personal effects; and a large hall for meetings, exhibitions, etc. It also possesses complete sets of apparatus for printing, making enlargements and lantern slides by electric light, with all facilities for operating the same.

DISTINGUISHED AMATEUR PHOTOGRAPHERS.—To the already long list of distinguished amateur photographers, says an evening paper, may be added the Princesses Maud and Victoria of Wales, who are thus able to return the compliment so constantly paid to them at public ceremonies. The Prince of Wales sometimes seems to be determined to avert his gaze from the camera of the ever-present photographer at a railway station or a stone-laying function. Four members of Parliament are well known as energetic and successful amateur photographers. Sir Richard Webster, Q.C., M.P., indulges in the art as a relief to the duties of an Attorney-General; Mr. Cyril Flower, the handsome representative of Luton in Parliament, has many negatives of Mr. Gladstone—the result of a visit paid by the right hon. gentlemen to Ashton Clinton; Sir A. K. Rollit, M.P., has dabbled in photography to a modest extent; while Mr. Patrick O'Brien, M.P., is, of course, famous for his doings at Tipperary and elsewhere. Mr. George Wyndham, M.P., tried his hand at rivalling Mr. O'Brien on his recent visit to some of the distressed portions of Ireland. Gustave Eiffel, who, like the Balbus of our Latin grammars, "built a tower," is an amateur photographer as well as an engineer. Mr. H. H. Johnston, the explorer, knows the dark room as well as the dark places of Africa. Another explorer, Nanssen, whose book so many are reading, is also a photographer of high ability. Miss Alice Longfellow, the daughter of the poet, practises the "gentle art;" and Mr. W. T. Stead did not disdain a detective camera at Oberammergau, although he was soon compelled to refrain from taking "snap shots" of the Passion play. The late Archbishop of York was an ardent photographer. For a long while before the present craze for this pleasing hobby, his Grace had taken a deep interest in the Dry Plate Club. Of the Amateur Photographic Association Dr. Thomson was a vice-president for many years. The various publications relating to photography—so numerous at the present day—were read by the Archbishop with keen enjoyment.

## Notes.

The second meeting of the International Photographic Congress will be held this year in Brussels, at some period not yet fixed, during the holding of the International Photographic Exhibition in that city. The Exhibition will open on the 10th of July, and close on the 5th of September. It will take place in the New Museum, a magnificent and comparatively new building on one side of the road leading from the King's Palace to the Palace of Justice. The latter the Belgians claim to be the finest secular building in the world; photographs of it on sale in London and elsewhere ordinarily do not do it justice, in consequence of the use—or rather misuse—of wide-angle lenses. All who wish to exhibit should write as soon as possible, or before May 1st at latest, to the secretary of the Belgian Association of Photographers, M. Ch. Puttemans, Industrial School, Boulevard du Hainaut, Brussels. If the exhibits are also intended for sale, they should let him know the price. In any case, the photographs will be submitted to a jury, who will decide as to their admission or otherwise to the Exhibition.

The Association will select the best of the accepted exhibits, and award to them diplomas of honour—gold medals, silver-gilt medals, bronze medals, and honourable mentions—in accordance with the decisions of a jury specially appointed to decide upon their merits. In the list of objects which may be exhibited, everything connected with photography seems to be included. The classification and terminology thereof are in accordance with the decisions last year at the Paris Conference, which seems to us to be reasonable, and to evolve order out of chaos. Why they have not been publicly discussed by any influential English photographic organisation is a mystery. One medal-in-chief will be given to the most meritorious of the exhibitors, no matter in what class he exhibits.

The jury will be composed of the president of the Belgian Photographic Association, of the general secretary of the Exhibition, of two persons to be elected by Belgians from among the members of the Association, of two members outside the Association to be nominated by the committee of the Association, and of five persons who are not exhibitors to be elected by foreign exhibitors; the latter will receive voting papers with their admission tickets.

At the close of the Exhibition there will be a lottery, the prizes in which will be some of the exposed objects. Exhibitors of photographs will have to pay five francs for every square metre, or fraction of a square metre, occupied by their pictures. All goods must be removed within eight days after the close of the Exhibition.

Each exhibitor must send his carte-de-visite before the 10th of June, with his signature thereupon, and with the number of his exhibit, to the general secretary, that it may be stamped, countersigned, and otherwise be turned into a non-transferable season ticket, in accordance with Belgian custom on railways and elsewhere. Those who wish full information should write to the secretary.

The new home of the Camera Club is in an unfinished state. The wintry wind whistleth through its vaulted aisles, and the owl hooteth on the battlements thereof:—

> "Here winter holds his unrejoicing court,
> And through his airy hall the loud misrule
> Of driving tempest is for ever heard;
> Here the grim tyrant meditates his wrath,
> Here arms his winds with all-subduing frost,
> Moulds his fierce hail, and treasures up the snows,
> With which he now oppresses half the globe."

At the last meeting of the Committee of the Camera Club fifty new members were elected. It is said that many more candidates are applying for admission, so that it is fair to assume that, on an early day, the Club will be pronounced "full," and future elections will therefore necessarily be slow. In consequence of the unfinished state of its new home, and another tenant being in possession of the old one, the Thursday evening meetings of the Camera Club will not be resumed until February.

From Melbourne has been sent to us a copy of the illustrated newspaper, *The Australasian*, setting forth how Mr. Farquhar, photographer, has succeeded in obtaining negatives of all the principal events at the Flemington Spring Races. A large engraving of the finish for the Melbourne Cup represents a number of horses with their legs in the ungainly positions previously revealed by the photographs of Mr. Muybridge. Mr. Farquhar used whole-plates in the work, and it is said that the time of exposure was 1-230th of a second, but no information is given as to how the speed of the shutter was ascertained. Perhaps more interesting than the attitudes of the horses are the expressions upon the faces of the winners and losers amongst the betting people in the crowd. Mr. Farquhar did not photograph the finish "broadside on," so that his task was easier than otherwise would have been the case; he intends to attempt the greater feat next year.

A few weeks ago, we commented in these columns upon the utilisation on shipboard of the optical lantern as a means of relieving the tedium of long voyages, and expressed a hope that the new departure would presently lead to wide adoption on ocean going steam ships. It would seem, however, that the lantern is destined to fulfil another service at sea, and one which is not for the mere amusement of passengers, but is put forward as a means of communicating with the shore or with neighbouring vessels in case of need. The system is described in the *Scientific American*, and is, we are told, "adapted for use by the mercantile marine, by lighthouses, signal, coast-guard, telegraph, and other stations, and for the use of lightships." The idea is simple, and, we should say, most effective if properly carried out. Briefly described, it comprises a sail rigged up at any required angle above the deck to act as a screen or sheet, and an optical lantern, by which the images of certain letters—cut out stencil fashion from thin metal, and acting as lantern slides—can be projected.

---

It is obvious that in this way the operator, if possessed of a complete alphabet of stencilled letters and numerals, can quickly cause their enlarged images to spell out any message which may be required. A lime-light or electric arc lamp would be the best form of luminant to employ, but on dark nights an oil lamp would answer the purpose; for the cut out letters transmit a far larger amount of light than any device upon glass, as anyone accustomed to lantern experiments well knows. The weak part of the system seems to lie in the ready way in which anyone can decipher signals which are meant for others. In this respect it falls behind the older method of signalling by means of long and short flashes which at present is in use in our navy. Still, the system is an ingenious one, and reflects credit upon its inventor, Mr. John W. Hayward, of Astor House, New York City.

---

The brightness of a stencilled figure as opposed to one prepared in the usual way on glass, was well shown in Mr. Beale's choreutoscope, which, we may remind our readers, is an instrument for projecting upon a screen a series of figures so rapidly following one another as to give the idea of movement, as in the case of the better-known zoetrope. One of the designs used in the instrument was a dancing skeleton, a device which admitted of being prepared as a stencil in thin brass. By use of such a stencil, a friend of ours—who was fond of practical jokes—cast the image of a skeleton upon the white side of a house near his own, much to the consternation of passers-by. The apparently dancing figure was about forty feet high, and it required a comparatively feeble light to project it that size. His little joke was only carried on for a few minutes, for the crowd which quickly assembled proved to be inconvenient, and very difficult to disperse.

---

A matter has been lately commented upon which will interest those who believe in the great future which lies before the optical lantern as an educational instrument. Of course, we all know that for some years it has been more or less used in colleges and schools, but that a recently appointed professor at Queen's College, Manchester, should announce his intention of illustrating a series of lectures on the British poets in the same popular manner is indeed a new departure. For our part we hail the news with delight, for we have long held that whatever be the subject of a lecture, it should be made as attractive as possible by the help of illustrations, experimental or pictorial. The difficulty in the case of such a subject as poetry will be to find pictures of a sufficiently good type for the purpose; copies from living models might certainly be arranged, but both models and those who group them must be selected with care, for the ridiculous is always within dangerous proximity of the sublime.

---

Whatever advantages "process" work has over wood engraving, there is in it one distinct inconvenience resulting from want of care which, when seen in the finished print, makes the artist feel inclined to tear his hair, and retire from public gaze for at least a month. The inconvenience in question is caused by the carelessness of the workman who mounts the block, and is generally in evidence in the place where it is most objectionable. We allude to the "printing up" of the nails which secure the plate to the block. When this happens, the nail almost invariably comes in the centre of the forehead, making the person look as if he had been crucified; or by the side of his nose, suggesting that nature had blessed him with an enormous wart. Why these nails persist in making themselves thus prominent is one of those things which no artist can understand. He can only put it down to pure "cussedness" on the part of the nail.

---

The death of Mr. Charles Keene, the well-known *Punch* artist, is announced. One of the features of Mr. Keene's drawings was what might be called a photographic quality. Unlike most comic draughtsmen, who are quite contented with two or three types upon which they ring the changes, Mr. Keene was laboriously exact in his sketches of character. He was continually going to nature for his bits of life; but we fancy that, unlike the photographic camera, he had not the power of seizing rapidly an expression; hence his range was somewhat limited. His work had not appeared in the pages of *Punch* for some months before his death, owing to the lingering illness which terminated fatally. *Punch* has been fortunate to secure a draughtsman of considerable original power to follow him in the person of Mr. Reed, the son of Sir Edward Reed, the late chief constructor of the Navy.

---

When Father Damien died, a whole host of newspapers which published his portrait was very neatly trapped. The only picture of Damien in existence was a photograph, not from life, but, as it turned out to be, from a drawing. When the philanthropist died, photographs were bought, copied, and published in the usual way. Directly after publication, however, the man who made the drawing came down heavily upon the proprietor of each newspaper who had infringed his copyright. He imposed his own terms —which in one case amounted to as much as £50— and the money was paid, because it was cheaper to pay even £50 than go to law with the certainty of being defeated.

## "OLD MASTERS" AT THE ACADEMY.

BY REV. F. C. LAMBERT, M.A.

THE twenty-second winter exhibition (now open) contains rather fewer "oils" than usual, but by way of compensation is offered an unusually interesting collection of water-colour work, which illustrates fairly well the history of art in that medium from about the middle of the last century up to recent times.

The first fifty-nine water-colours will be found in the little "black-and-white room," commencing with seven works by Paul Sandby, R.A. (1725-1809), lent by H.M. the Queen, representing various views in and about Windsor and Hyde Park—all characteristic of the artist. Then come two architectural works by Michael Angelo Rooker, A.R.A.

Nos. 16-29 form an interesting series of works by J. R. Cozens; Nos. 16 and 17 are both good examples; Nos. 18 and 19 are severely formal in composition; No. 25 is very cold in tone, but of skilful form; No. 23 being, perhaps, the most attractive, by reason of the able rendering of distance and atmosphere.

Two pictures (Nos. 30 and 31), the latter signed and dated 1813, by François L. T. Francia, are well worth notice for their broad and simple treatment. The "Pool of London," by J. C. Barrow, representing the great frost of 1789, which was of European fame, comes before us just at a time when the old-fashioned winters are better in art than in fact. Close by is another old Thames view, under more agreeable climatic conditions, from the brush of Thomas Girtin. Nine other works by this master are shown, none of which present him at his best; perhaps Durham (No. 38) and Lichfield Cathedral (No. 44) are the most noteworthy; while the rainbow in No. 42 is a failure; and No. 40 (Peterborough Cathedral) certainly gives one the feeling of a wide-angle lens used "not wisely . . . &c." Two of Henry Edridge's (Nos. 48 and 49) are of his average quality. The remaining ten works in this room are by John Varley, of which Nos. 54 and 55 will well repay examination.

Passing now into the Water Colour Room, we find ten examples of J. S. Cotman. Note the *flow* of the water in No. 60. In No. 62 we have a splendid piece of cloud drawing, and at once say, "this man would have appreciated a good cloud photograph." [Cotman is also known by his two-volume work on the "Architectural Antiquities of Normandy," and also for a volume on "Sepulchral Brasses of Norfolk."] The "Sea Piece" (No. 66) indicates possibly some influence of Turner, to whom Cotman was junior (1780-1820). Next, we have no less than twelve examples of David Cox; of these Nos. 70, 71 are very fine; No. 74 will delight the advocates of rough paper; No. 76 is interesting as showing the masters' method of treating water. For two years in succession the authorities have shown us some Turners, and once again we have a baker's dozen. The first example (No. 82, sea piece) is interesting as showing his method of working with body colour on tinted paper, with indications of the lead pencil being used with fine effect. No. 85 is very sweet and tender, painted in one of his brightest moods. No. 87, York, is more after his early method, and No. 91 again shows his power of dealing with bright sunlight; the sun in his lens, as *we* should say. It is here well worth noting that Nos. 82, 83, 86, 93, 94, show Turner's mastery in depicting rough water, while Nos. 84, 87, 91, 92 give his other method in dealing with a placid, calm surface.

Peter de Wint (1783-1849), practically a contemporary with Turner, is represented by nine pictures. He also appears to have had two modes, which are represented by Nos. 96, 98, and by 99, 102. No. 103 is exceedingly interesting, as showing his highly successful rendering of a primary and secondary rainbow, an effect seldom seen, and, perhaps, never before attempted in painting. Next come twelve frames containing fairly representative work of William Hunt (1790-1864). Of these, No. 108, "The Cricketer," is a splendid example of vigour and "go," giving one an idea of what an *ideal* snap-shot with the camera might be. In No. 112 the boys' faces are not sufficiently typical in form or colour; otherwise the picture is very fine in artistic quality. George Barret is represented by seven works, Nos. 116-122. Of these Nos. 117, 121, and especially 122, may be taken as representing his power in depicting scenes bathed in warm light. Prout is only represented by two very un-Prout-like works, while G. F. Robson is well seen in No. 131, "Durham." R. P. Bonnington also is well represented by Nos. 135 and 136. Samuel Palmer's vivid colouring is adequately presented in Nos. 139 and 140. Of the six pictures by J. F. Lewis, No. 142 is conspicuous, and, in a truly wonderful manner, indicates the outside bright sunlight by showing its effect diffused in and throughout the interior of a harem, with here and there patches of stronger light finding their way through the lattice. The lesson this picture conveys to interior photographers as regards transparency and luminosity of shadow is most valuable. The water-colour section closes with fourteen examples, Nos. 147-160, by a modern master whose life was cut short in his prime. If F. Walker (1840-1875) had only painted these fourteen pictures, they would entitle him to rank as a painter of the first order. Space does not permit notes upon each picture at length; but No. 150, "The Old Farm Garden," No. 152, "Girl driving Geese," No. 154, "Vale of Rest," No. 158, "The Ferry," No. 156, "Philip in Church"—in fact, every one of these splendid works, must be seen. Note how, in nearly every one, he catches a figure at a point of graceful rest, and yet with all the swing and go of full motion. Note, too, how the light bathes the whole scene, especially in Nos. 154 and 158. Here was a man who, we are told, only would put brush to paper when the fit was on him, but "a little and good" was perhaps his motto.

Of the oils of those painters whom we more generally designate as old masters, the first room contains many good examples by Gainsborough, Reynolds, &c. In No. 1 we see Gainsborough as a landscapist, followed by several of his portraits. In Nos. 9 and 39 John Crome shows his regular "crome-esque" trees, &c. George Romney gives a lady's portrait, nor does the pigment seem to have been as much affected by time as most of the other paintings in this room; the colouring of this (No. 10) is very fine; the shadows are grandly luminous. A scene from "Comus" by Etty (No. 13) is in his usual graceful form. Turner is seen to disadvantage in No. 18, and to advantage in a sea piece, No. 21. Two snow pieces by Sir E. Landseer seem to throw the whole room out of harmony. When it is remembered that this room contains seven Gainsboroughs, five Sir Joshuas, five Romneys, two Hogarths, three Zoffanys, two Turners, two Hoppners, and many others, it will be seen at once that any incongruous element is a matter for regret. On taking a last look, it will be noticed that all the ladies are presented in big hats, and one wonders how they managed to keep them "fixed" at such a high angle, especially in windy weather.

As we enter Room II., we find it is now the turn for the gentlemen to take the big hat. This room, as usual, is a Dutchman's gallery, containing many fine and seldom seen examples. On no account must the visitor fail to notice several magnificent portaits by Frans Hals, Nos. 69, 71, 72, 73; two typical river pieces (Nos. 49 and 54) by Jan van Goyen; two interiors (Nos. 53 and 78) by David Teniers; a very characteristic waterfall (No. 58) by Jacob van Ruysdael; an equally typical Hobbema landscape (No. 60); two regular Cuyp cattle pieces (Nos. 81 and 87); and No. 76, a Wouverman *without* his white horse trade mark.

In Rooms III. and IV. there are also many fine and typical works, which are for the first time put before the public. From among the many, one may mention a few which certainly should be seen, viz., No. 99, Palma Vecchio; No. 106, Spagnoletto; No. 107, Canaletto; No. 108, Claude; Nos. 112, 113, 116, Velasquez; No. 114, Murillo; No. 118, Tintoretto; No. 121, Hals; Nos. 123, 125, Van Dyck; No. 130, Romney; No. 146, Pinturicchio; &c., &c.

The early examples are of great interest to the historic student of art, and also to the archæologist; but, quite apart from either of these two particular ways of examining this year's gathering, all genuine and earnest students of painting will find themselves well repaid by a quiet and thoughtful examination of the works now brought together in Burlington House.

To photographers, the water-colour drawings should be of special interest, as they are, for the most part, typical of English painters at a time just before the advent of camera work.

---

The Photographic Club.—The subject for discussion on January 14th will be "Dark-Room Illuminants;" January 21st, "American Slides."

The Proposed Photographic Institute.—At a recent meeting of the Photographic Society, Mr. W. S. Bird said that they would all have read the report of the committee which had been deputed to consider the subject of the proposed Photographic Institute. Their labours had resulted in the drawing up of a large scheme and of a smaller scheme. The larger scheme was a project of the future, but the smaller one was of a more practicable nature, and the committee had had the advantage of conferring with the Lord Mayor on the subject, who thought that it might be possible to collect a sum which had for its limit £10,000, provided that the project was shown to be of public utility. If this was so, he thought that the photographic community generally should take some steps towards defining practical methods of carrying the scheme forward, and then they could approach the Lord Mayor with this project, and with some promises of financial support. In foreign countries the Government provided the means by which such institutions were founded, and in Berlin it took a very practical character, but in England this was not the case; he (Mr. Bird) felt that if this movement was to be a success, it must begin at home, and the Photographic Society ought to use what influence it possesses to assist in the work. Mr. W. Bedford thought that substantial assistance might be derived from the city companies if they thought the scheme would be likely to redound to their credit. The city companies were looking for praiseworthy objects on which to expend their funds, and photography was certainly a science and an art which might justly claim a portion of the wealth which had been accumulated. He did not think that very much assistance was to be expected from the various photographic societies, but at least they could do good by bringing the matter before the notice of their members.

## PHOTOGRAPHY IN GERMANY.

BY DR. H. W. VOGEL.

Stripping the Negative with Fluoric Acid—Eggenweiler's Gallery—Ruget's New Zircon Light—Schirm's New Flash-Lamp.

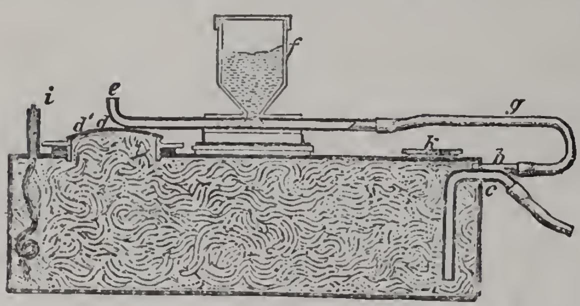
*Stripping the Negative with Fluoric Acid.*—It is now an easy matter to strip and reverse gelatine negatives. The process is old and used by only a few. Fluoric acid is used; this is kept in gutta-percha bottles. Glass and the hands have to be protected. The acid should be measured in a silver thimble with a wooden handle, and must be diluted with a hundred times its volume of water. Asphaltum dishes should alone be used. The acid is harmless in a diluted condition. In this diluted acid the gelatine negative is placed, and after about two minutes it will strip completely from the glass; the film may then be placed in water. Here it stretches about one-third of its length and width, so that a picture $6\frac{2}{3}$ by $10\frac{2}{3}$ will appear in place of the 5 by 8. A larger size is thus obtained, to the advantage of the photographer. The film is left under water until the desired extension has been reached, and the skin is caught again under water upon a glass, and left to drain in a horizontal position. The facility and rapidity with which the work proceeds are generally astonishing. If carbon prints or collotypes are desired they are reversed.

*Eggenweiler's Gallery.*—For the last two years the gallery construction of Eggenweiler has been recommended, and I believe that it is of particular interest for America, with its brighter sunlights and less dark days. The most peculiar feature of the gallery is that it has no skylight. It is a high room situated on the north side, with a northern glass side twenty feet high, but without glass roof. The roof, which admits no light, does not incline towards the front, but falls pretty sharply towards the rear, and is painted with a light colour on the inside. At a certain height, about ten feet from the floor, a semi-transparent white covering of gauze has been spread horizontally. This receives a strong light from the extensive glass side and the reflecting roof, and serves as a substitute for the top light. I, for my part, do not consider this screen necessary. The Court photographer, Mr. Kuntze, deems it worthy of our consideration. It cannot suffer from rain or snow, and has the advantage of excluding the sunlight completely, besides being much cheaper than an ordinary studio.

*Ruget's New Zircon Light.*—Mr. Richard Hugel, as representative of Setten and Company, exhibits a new incandescent gas lamp of the latest construction after Dr. Auer's system, for enlargement. The principle of the same is based upon the essential heating power of the gas brought to combustion in a Bunsen burner by application of the lighter hydrocarbons (petroleum gas) and repeated suction of air containing oxygen, so that the illuminating power of the glowing zircon body hanging in the flame is thus considerably increased. The apparatus necessary for this consists of a tin dish with two projecting short pipes, to which is attached some rubber tubing. Through one of these tubes air is introduced into the dish pneumatically by pressing the rubber bulb, while the air, impregnated with petroleum gases, passes from the other tube and reaches the Bunsen burner. The illuminating power of the Auer burner is thus brought to a strength of from sixty to eighty candles. The price of this light, including the gradual consumption of the zircon body, is from 4 to $4\frac{1}{2}$ pfennigs per hour. The effect of the flame and its whiteness are brilliant.

*Schirm's New Flash-Lamp.*—Upon a very similar principle the benzine flash-lamp of Schirm has been constructed. The apparatus consists of a tin vessel, *a*, filled with spongy matter, which is soaked with benzine. All free liquid is poured off. A small tube, *c*, which empties into the vessel, is connected with a pneumatic apparatus. This apparatus (rubber bulb) must be provided with two valves which carry the air only in one direction, and prevent a back-suction from the flame. In the upper part of the lamp is a cover, *d*, that can be screwed off, with fine openings around a circular line. Above the middle of this circle with the opening for the gas passage, the magnesium blow-pipe, *e*, with the magnesium carrier, *f*, can be inserted. This blow-pipe is connected by a thin rubber tube, *g*, with a pipe-end, *h*, near the pipe *c*. Close to the above-described burner is a small tube, *i*, filled with a wick, at whose end the flame is burning, which serves to ignite the emitted gas.

The action of the apparatus is the following: By pressure upon the bulb air is forced through the vessel and is fed with benzine gases, passes partly through the ring of fine openings *d*, ignites at the flame *i*, and forms a long, extremely intense flame. Another part of the air, saturated with combustible gas, passes through the magnesium




conducting-pipe *e*, receives here the magnesium powder, and conducts it to the above-mentioned flame for combustion. In this way an extremely intense and complete combustion is obtained, and the illuminating power of the burning magnesium powder is considerably increased.

This new lamp combines the advantage of the Bunsen burner (with great heating power) with the easy transporting facility of the former spirit lamp, harmless manipulation, great economy in burning material, and increased illuminating power. While the spirit lamp, when frequently used, had always to be refilled again, and a considerable consumption of burning material took place, one filling will now be sufficient for 1,000 flashes, and the lamp, containing no free liquid, can be transported without inconvenience. Every danger is also excluded, as in case of an upsetting of the lamp no combustible matter will run out, and the small flame will be at once extinguished. The magnesium supply for this lamp is so arranged that as soon as the magnesium reservoir stands upright the magnesium powder will fill the blow-pipe of its own accord, and a slight tap on the lamp is sufficient, after each flash, to effect a new fill with the powder. If the magnesium reservoir is turned over the magnesium supply is shut off. To fill the lamp the screw, *k*, is opened, a quantity of benzine is poured in, and the opening is closed again. After unscrewing the cover, which protects the ring of fine gas passages, *d*, during transportation, insertion of the blow-pipe into the middle of this opening, ignition of the flame, and opening of the magnesium reservoir, the apparatus is ready for use. To keep the apparatus in order, the small opening, *d*, should be cleaned sometimes with a needle, and it should not be neglected to turn the reservoir over before the last flash, to prevent the magnesium powder from reaching the lamp part during transportation. As soon as the flame becomes weak and is not very perceptible, a new filling is required. If a continued light-stream (by blowing, for instance) is driven through the lamp, and the magnesium reservoir is slightly tapped with the fingers, a lasting light can be produced.—*Anthony's Photographic Bulletin.*

## PHOTOGRAPHY IN VIENNA.

The History of Photography—Orthochromatic Photography—A Correction—Cristallos.

*The History of Photography.*—The only history of photography at present in existence is written in English. But the materials have increased so much, and the subject is so interesting, that several German authors are busy meeting this want in literature. In the first place, J. M. Eder, in his great "Handbuch," has devoted much space to the historical department with rare thoroughness, collecting all information about light and its effects from the times of the Greeks and Romans down to Daguerre. But from there he rapidly passes in review the development of photography. A second work, of which a preliminary notice has already appeared, is being prepared by an author named Charles Schiendl. It is likely to form a portly 8vo. volume. This book passes rapidly over the beginning of photo-chemistry, but becomes more detailed from that point on when the first pictures were produced by camera. Doubtless it will be interesting reading, as the author has the advantage of the valuable help of Davanne, Carey Lea, and other leading men.

*Orthochromatic Photography.* — Recently the learned Berlin investigators, Dr. H. W. Vogel and Dr. Neuhauss, have been engaged in an interesting enquiry concerning the priority of the discovery of orthochromatic photography. This controversy is likely to throw a light not only on the chronological succession of the theoretical speculations which preceded the practical success, but also on the real nature of the thing itself. In a technical journal here, Dr. Neuhauss has described the matter very objectively, it would seem, as follows:—

"In practical photography it has long been known as a fact that the addition of silver iodide to silver chloride or silver bromide greatly increases the sensitiveness of the silver salts for those spectral colours which are near the red end of the spectrum. To explain this phenomenon, Schultz-Sellack made several experiments, guided by the thought of the connection between the absorption and the chemical action of the rays. Such a connection had been made probable by Herschel's experiments concerning the fading of vegetable colouring matters, and by Draper's experiments on the decomposition of oxalate of iron.

"According to the method described by him, Schultz-Sellack melted the silver salts to masses clear as glass, which are particularly adapted for investigating optic absorption, and which change but slowly under the action of light. In this condition silver chloride is colourless; iodide light yellow and transparent; silver bromide is a somewhat darker yellow, but the mixture obtained by melting the last two is orange. Tested by photography, silver chloride showed itself sensitive only for the outside violet to about half way between Fraunhofer's lines H and G, iodide sensitive beyond G, silver bromide nearly to line F, a mixture of iodide and silver bromide to line E. Therefore the weak absorption of light by silver chloride comes together with weak photographic action, which is confined to the violet end of the spectrum. On the other hand, the increasing yellow and yellow-red colouring of the silver salts brings with it an increased sensibility for the blue-green and green division of the spectrum, that is, for those colours which are absorbed by the silver salts. In spectral examination the optic absorption of transparent plates of these substances shows itself to be strictly confined to the limits of chemicals already given."

Schultz-Sellack sums up his discovery in these words:—"I have found that optical and chemical absorption of light exactly correspond. All colours which are noticeably optically absorbed by the silver haloid-salts—in a thickness of some millimetres—produce chemical decomposition; the absorption of light with these materials is always united to chemical action." Again: "The haloid combinations of the silver are chemically changed by all the rays that they absorbed in any appreciable degree."

This last sentence is the foundation-pillar of all orthochromatic photography. There is but a single step from Schultz-Sellack's discovery to producing plates sensitive for green, yellow, red, with the help of the addition of colouring stuffs to the light-sensitive silver salts. To H. Vogel belongs the credit of having taken that step. A fortunate accident made it easier for him. Vogel found, namely, that English Wortley plates examined by him were unusually sensitive in the green at line E. He surmised that these plates contained some substance which absorbs green in a high degree, and found this surmise fully confirmed. The Wortley plates contained nitrate of uranium, gum, gallic acid, and a yellow colouring material as a coating. Vogel removed the colouring by washing with alcohol and water, and then had a plate which no longer showed signs of increased sensibility in green. Encouraged by this observation, he added a colouring agent to the silver bromide, which absorbs particularly the yellow rays, in the hope of thereby increasing the sensitiveness for yellow. For this purpose he chose an alcoholic solution of coralline, which, very much thinned in the spectroscope shows an absorption-stripe between D and E (yellow-green). As a matter of fact, such plates showed great sensibility for yellow-green rays.

The relation of Vogel's discovery to Schultz-Sellack's is best characterised by the former's own words: "The experiments to the fullest extent confirm the connection between absorption and chemical force (first surmised by Draper and Herschel, and confirmed by Schultz-Sellack), or they extend the views hitherto entertained. Schultz-Sellack supposes that silver haloid salts are chemically changed only by the rays which they absorb to a perceptible extent. My experiments show that not only the optic absorbing capacity of the sensitive silver salts themselves, but also the optic absorbing capacity of added substances, plays a part in the sensibility to light of photographic plates. Also Schultz-Sellack expressly emphasises the fact that Vogel's discovery only confirms the facts found out by him (Schultz-Sellack)."

Most objection has been taken to the expression "optical sensitizers" chosen by Dr. Vogel, for, as a fact, the fading of colours or their sensitiveness to light is a chemical process, not a physical one. Without this sensitiveness to light, these colours added to the emulsion are hardly adapted to play a part as sensitizers. But well-informed persons have adopted Vogel's doctrine, and assert that the *chemical* sensitizers produce an increase of general sensibility all over the plate, whereas *optical* sensitizers shift the conditions of sensibility of single parts of a plate; they limit the sensitiveness to certain optical regions, *e.g.*, green, red, namely, for those coloured rays which they absorb, by which means they themselves are decomposed. From this point of view, say they, the name of optical sensitizers is fully justified.

This view might be upset if one found completely colourless sensitizers which act sensitisingly for single parts of the spectrum. But it has not been proved that such exist, although for a time "salicine" was believed to do so. But as these are *colours* which absorb certain rays without, however, being changed by those rays, therefore their changes cannot be transferred to bromide of silver or iodide of silver, and this party concludes therefrom that such stuffs lack the capacity of sensitizing —that they are not sensitizers. The limitation of chemical action on certain optic areas is obtained by interposing coloured glasses which do not allow certain colours of the spectrum to pass, which is certainly a physical process, and from this they derive the justification of the expression "optical sensitizers" for those which localise effect of light.

Having here given the views of the opposing parties, I must leave it to the future and further experience which view finally wins the day.

*A Correction.*—I must make two small corrections in my former letters. Mr. Victor Angerer (see p. 1684), as I have since learnt, is a passionate angler, and the accident happened to him while crossing a weir in the Danube. Again, among the periodicals appearing in Vienna, for a short time now there has been a small monthly one called *Photographie* (see p. 1684).

*Cristallos.*—This developer, mentioned by Mr. Putz, consists, according to an analysis made by an able chemist, of the following composition:—

| | | |
|---|---|---|
| Hydroquinone... ... ... ... | 9 | grammes |
| Sulphite of sodium ... ... ... | 30 | ,, |
| Ferrocyanide of potassium ... ... | 5 | ,, |
| Caustic soda ... ... ... ... | 20 | ,, |
| Water ... ... ... ... ... | 200 | ,, |

A developer made according to this receipt produced exactly the same effects as the French cristallos. Hitherto it has not been possible to find out what the colouring substance is, but it is only an ornament, and not an essential component.

Photographers' Benevolent Association.—At the meeting held on the 2nd inst. (Mr. Benham chairman), three applications for assistance were considered and granted.

Newcastle-on-Tyne and Northern Counties Photographic Association.—The annual meeting will be held on Tuesday, January 13th, 1891, in the Morley Street Café, Newcastle-on-Tyne, at 7.30 p.m.

The *Photo-Gazette* (Paris), in its number for December 25th, 1890, just to hand, contains an illustration of M. Balagny's collographic process on flexible bichromatised plates, together with an explanation by the inventor.

In the *Photographisches Archiv*, also, M. Balagny is quoted in connection with a new instruction for development with hydrochinon.

## Literary Notices.

Photographischer Almanach und Kalender fuer das Jahr 1891. (*Dusseldorf: Ed. Liesegang.*)

The photographic almanac annually issued by Dr. Liesegang is less bulky than most of the contemporary publications of a similar kind, but contains much useful matter. The calendar is full of references to events of a photographic character, the observation of which, when it is referred to for the customary purpose of ascertaining current dates, is calculated to instil a certain amount of historical knowledge of photography, an element which we have found to be very deficient amongst photographers, both professional and amateur, especially, as a matter of course, amongst the newer devotees of the science.

The almanac is illustrated by three photo-ink reproductions; the first is a collotype portrait of Franz Veress, whose labours in the field of colour photography created so much stir a short time since. The very intelligent head of Herr Veress is seen to advantage in this collotype, of the quality of which it may be enough to say that it looks like a fine platinotype. A short biographical notice and description accompanies the portrait. Of the importance of Herr Veress' improvements we are hardly as yet in a position to judge, but it is scarcely probable that Dr. Eder would have spoken of them in the high terms he did if they were of the insignificance that in some quarters has been attributed to them.

A print from a half-tone zinc etching by Tuercke, whose process has been described in our Year-Book, is a good example of a river view with buildings, as rendered by a method of typographic printing; but the most charming illustration, to our mind, is that of a scene at Grönenbach reproduced in collotype by, as we are told, a pupil in Crowenberg's institute of instruction. There is a beautiful range of tone that gives life and reality to the whole. This is shown particularly in the deeper parts, where what would be a general heaviness in some processes is rendered luminous by the clear brightness of small portions of decidedly greater depth.

The subject of the colour of the light best suited for dark-room illumination, and the objectionable character of red light as affecting the eyesight, appears to be attracting attention in Germany just now, for besides a paragraph by Herr Liesegang, in which he mentions that the injurious character of red light is now generally accepted as a fact, we find an article by Arno Kersten, in which he says that we cannot caution too much against the use of red light, which is so very injurious to the eyes. He recommends, in place of red, to paste upon one or both sides of ordinary glass several thicknesses of a paper which is in common commercial use in Germany, and is known as "Rehbraunen Seidenpapier." This is a paper of a fawn or sienna colour. When dry, the paper is rendered translucent by imbuing it with vaseline or paraffin, and a pleasant light is obtained that is not trying to the eyes. As a source of light, he advises petroleum or gas, on account of the varying character of daylight. He adds that he has now used this yellowish light for some years, after having seriously impaired his sight by the use of red light.

As the result of a canvass amongst professional photographers in Germany to ascertain the developer most in use, we are told that more than half employ the ferrous oxalate, 25 per cent. eikonogen, 15 per cent. hydrokinone, and 10 per cent. the pyrogallic developer. This is, we should say, a very different result from that which would represent the practice of photographers in this country, where the relative proportions of the users of pyro and ferrous oxalate would be probably found to be about in a reverse ratio. Amongst amateurs we are given a different proportion, hydrokinone being the favourite with 30 per cent., eikonogen next with 26 per cent.; then follows ferrous oxalate with 20 per cent., and last again pyro with 16 per cent. It would be interesting to have some explanation of this curious diversity of practice.

Amongst information useful to tourist photographers is a list of dark rooms available for travellers' use, and we are pleased to notice that the list for England occupies more space than is taken by those of all the other countries mentioned.

There are, of course, a number of articles which our space will not permit us to go into, but many of which will well repay perusal, and a compact summary of formulæ completes a work which will doubtless command a large circulation wherever there are photographers to whom a work in the German language is intelligible.

---

The American Annual of Photography for 1891. (*The Scovil and Adams Company, New York; Hamilton, Judd, and Company, London.*)

This annual is about double the size of those published in England; it is also double the price. The most interesting article in it is that by Mr. C. W. Canfield, illustrated by twelve authentic portraits of Daguerre, reproduced by photo-mechanical processes. The other articles contain more or less useful practical information, and there are plenty of photo-mechanical illustrations, varying much in quality. Mr. S. F. H. Hewitt gives the following reducing formula, which he says is better than Mr. Farmer's when an acid fixing bath has been used:—

Belitski's Acid Reducer.

| | |
|---|---|
| Water ... ... ... ... ... | 7 ounces |
| Potassium ferric oxalate ... ... ... | 2½ drams |
| Crystallised neutral sulphite of soda ... | 2 ,, |
| Powdered oxalic acid ... ... | 30 to 45 grains |
| Hyposulphite of soda ... ... ... | 1½ ounces |

The solution must be made in the order given; filtered, and kept in tightly closed bottles in subdued light. This reducer can be used over and over again, and keeps well for months. With repeated use its activity is not diminished, because the oxygen that had parted from the ferric salt in favour of the silver is replaced by absorption from the atmospheric air. The acid reducing fluid tans gelatine films.

---

Pyro-Stained Hands.—*L'Amateur Photographic* advises the following solution for ridding the fingers and hands of pyrogallic stains:—Hydrochloric acid 93 grammes, oxalic acid 22 grammes, phosphoric acid 25 grammes, and water 500. For our part, we have found a strong solution of citric acid sufficient in almost every case. It is remarkable that some people's fingers become more deeply stained than others under similar conditions. Hydrochloric acid diluted in proportion of about 1 to 5 is with many manipulators sufficiently effective. We should, however, recommend the following method: Whilst developing, have by one a beaker filled with water, in which a few crystals of citric acid have been dissolved, and from time to time, as the fingers come in contact with the developer, dip them in the solution, and rinse them under the tap. When the work is completed, scrub the fingers and nails with a *clean* nailbrush, using the citric acid solution, and in all cases, of course, avoid the use of soap or soapy water, the alkaline nature of which will undo all the good services of the acid.—*The Photographic Art Journal*,

## HIGH RELIEF BLOCKS.

In no department of photography has there been more striking progress in the last few years than in the production of high relief blocks for printing along with letterpress matter. We have numerous instances of this improvement in the commercial use of such blocks for illustrating current periodical literature, but it is probably more thoroughly and extensively carried out in Germany than elsewhere. We have before us the current number of the *Radfahr Chronik*, a journal devoted to cycling, published at Munich, which is plentifully illustrated in this way. On the front page is a Meissenbach reproduction from a negative of a cyclists' congress held at Liege, in the course of last year. The picture is about nine inches in length, and contains representations of about eighty cyclists with their machines grouped in front of a handsome building, and enlivened by trees. Not only is the foliage well defined and free from heaviness, but the faces, although each but little larger than the head of an ordinary pin, come out with so much distinctness that as portraits they must be easily recognised by persons acquainted with the originals.

## FIRE AT MESSRS. STONE & CO.'S.

A MOST disastrous fire broke out on the night of the 5th inst. on the premises of Messrs. Stone and Co., photographic mount makers, of 7 and 8, Fulwood's Rents, W.C. The flames were first noticed at about 12·30 shooting through the roof of No. 8, and the firemen at once received a call. It was some time before an adequate supply of water could be used, on account of the difficulty in approaching the building, and meantime the fire had spread to No. 7. The contents of the building were mostly papers, and these, especially in the upper floors, were very inflammable, as this portion of the premises is heated by steam, and the large sheets of paper are separated there for drying. It was not till four o'clock in the morning that the fire, after the united efforts of some sixty or seventy firemen and twelve steam engines, directed by Captain Shaw in person, was got under, and meantime it had spread to the adjoining premises, No. 6, Fulwood's Rents, occupied by Sir Joseph Causton and Co., wholesale stationers, and also at the back to Waldack's private hotel, of which the whole of the back portion was completely gutted. The wind was from the north and took the flames in a southerly direction; had it been otherwise the adjoining premises on the north side, a large factory, occupying the space of three houses, Nos. 9, 10, 11, in the occupation of Messrs. Watson and Sons, as a photographic cabinet shop, and in which are stored immense piles of dry wood used by them for their cameras, would have caught fire, and in this case nothing could have prevented an enormous conflagration; but, excepting a few charred beams, which were extinguished almost as soon as they lighted, the breakage of all the back windows and the skylights, and the flooding of the basement with water, Messrs. Watson and Sons have escaped. Messrs. Stone's premises were reduced to a shell; the mass of burning material in the basement was so hot that it was practically impossible to enter the building during the 6th inst., and the hose was kept playing on the ruins all day; late in the evening this was discontinued. About three o'clock in the morning, however, flames again broke out, and at four o'clock the fire was almost as bad as on the previous night. The hose was kept playing till a late hour on Wednesday, 7th. Messrs. Stone and Co. are well known to photographers for their mounts; they have occupied these premises for twenty-six years, and this is their first experience of such a disaster. They were insured.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. — An ordinary meeting will be held at 50, Great Russell Street, Bloomsbury, W.C., on Tuesday, 13th inst., at 8 p.m. A paper will be read by Mr. E. W. Maunder, F.R.A.S., on "Photography Applied to Astronomy."

# Patent Intelligence.

### Applications for Letters Patent.

20,852. J. U. CLARKE, 3 College Road, Harrow, "Photographic Shutters."—December 22nd.

20,876. R. STIRN, 55, Chancery Lane, London, "Camera."—December 22nd.

20,931. K. F. JEKELI and J. HORNER, 37, Chancery Lane, London, "Cameras."—December 23rd.

21,012. G. G. ROCKWOOD, Monument Chambers, King William Street, London, "Panoramic Cameras."—December 26th.

21,059. G. F. REDFERN, 4, South Street, Finsbury, London, "Photographic Negatives" (J. M. Jordan, United States).—December 26th.

21,302. A. EVERSHED and B. WILD, 28, Hatton Garden, London, "Cameras."—December 31st.

78. W. NICOL, Mason College, Birmingham, "Dark Slides."—January 2nd.

### Specifications Published.

1,715. *February 1st*, 1890.—"Exposing a Succession of Photographic Films." MARSHALL ARTHUR WIER, 3, Palace Grove, Upper Norwood, Surrey, Engineer.

My invention relates to that class of photographic camera where a number of sensitised films are exposed one after the other without the use of dark slides. It consists of a rectangular receptacle or film-box for the purpose of holding the films. To change the films after exposure, I cause the exposed film to travel from the front of the receptacle to the rear thereof, and in order to cause this action to take place I employ rollers, which are suitably placed on the film-box or receptacle. The rollers may be placed thus: One on the front, one on the top, and one at the rear sides of the film-box. The front roller is a spring roller, on to which a band or ribbon of suitable material is wound a few times, the other end of the band being attached to the rear roller. On the front of the film-box is placed a movable or sliding frame, against which the edges of the films are caused to press by any suitable means.

When the film, after exposure, is to be removed to the rear of the film-box, the front frame is first pushed up; this action brings one edge of the film into position between the front roller, the band, and the middle or top roller, and, upon turning the rear roller by means of a suitable handle, the band is wound upon it and the film is drawn up, over the top roller, and down into the rear part of the film-box, the spring roller rewinding the band back again upon releasing the hold upon the handle. Instead of the top roller, a half round fixed piece may be employed. By means of the roller and band arrangement, the exposed films may be drawn to any other place or position in the box by suitably adjusting their relative positions.

The above arrangement may be fitted into a box to form a hand or detective camera, or it may be formed into a separate narrow box so that it may be used in a similar manner to the well known roller slide.

2,023. *February 7th*, 1890.—"Improvements in Enlarging Cameras." WALTER GRIFFITHS, Highgate Square, Birmingham, Manufacturer.

My invention has for its object improvements in enlarging cameras, by means of which I am enabled to enlarge to any extent upon either glass or paper from an ordinary negative in a simple, quick, and effective manner by daylight, or with an ordinary lamp, and without the necessity of working the camera in a dark room.

In carrying my invention into effect, I form the enlarging camera with an oblong body or box, preferably square and open at the ends, and formed of any such suitable material as wood, metal, stout mill-board, or straw-board; but I prefer to form it of either of the two latter, the ends being in that case strengthened with wood bands. At the one end I fix the carrier in which the negative is placed, the lens being placed in the centre of the body, and is so constructed and framed in a sliding partition that it may be moved backwards and forwards within the body at the will of the operator. At the other end I provide au end which telescopes within the body, in which a dark slide, cousisting of a frame with back and shutter, aud having a plain glass fixed therein, which is provided so that either sensitive paper or glass can be used as required, and which at the same time registers a position for correctly focussing the plate by the use of a smaller piece of ground glass which is held against the clear glass in the dark slide until the proper focus has been obtained by the telescope movement, after which the sensitive glass or paper is inserted in the place of the ground glass, in which position, it will be understood, it is exactly the same focus as the ground glass used for the purpose of focussing.

The action of using my enlarging camera is as follows :—

I insert the negative in the carrier with the film towards the lens. Draw the shutter, take out the back of the dark slide, and adjust the lens partition, and slide part until the required focus is seen upon the glass in the dark slide. To move the lens partition I remove the cap from negative end, which then admits the hands, after which I focus accurately by placing the square of fine ground glass against the large piece of clear glass about midway between centre and edge in any direction. I then charge the slide with the sensitive paper or plate iu the dark room with its face uext the glass, replace the back, and see that the shutter is closed, afterwards inserting the slide in the camera, and exposiug according to circumstances.

My improvements, therefore, consist in the particular arrangemeut and constructiou of the various parts, as well as the use of the clear glass iu the dark slide, the whole forming a compact, portable, and cheap enlarging camera, easy of focus, and capable of beiug worked in the light aud with an ordinary lamp.

2,626. *February 18th*, 1890. "Opalescent Glass." Charles Huelser, of Huelser and Co., 142, Fleet Street, Loudon, Solicitors of Patents. (A communicatian from abroad by Joseph Kempner, of Berliner Strasse No. 60, Goerlitz, Germany, Merchant.)

The object of this inventiou is a new process, derived from melting experiments, for producing opalescent glass. Said experiments have demonstrated that fluorides of alkalies alone do not produce opalescent glass—which fact is also established by other tests (*vide Dingler's Polytechnisches Journal*, vol. 256, p. 361, 1885)—that even cryolite produces opalescent glass only if added iu a large proportion ; that, however, silicofluorides of alkalies (silicofluoride of sodium or silicofluoride of potassium) or compounds thereof, when added in a relatively small quantity to a glass batch of auy suitable composition, produce au intensely opalescent glass. The communicator, for instance, ascertained that when adding to three equal batches of the same compositiou respectively ten grammes of fluoride of sodium, cryolite, and silicofluoride of sodium, the first two mixtures resulted in a perfectly clear white glass, but the third mixture, containing silicofluoride of sodium, in a completely milky, opalescent glass.

When making batches for opalescent glass in glass works, the proportion of silicofluoride of alkali to be incorporated will naturally depend on the nature of the substances constituting the glass batch, on the temperature of the furnace, and on the degree of dullness desired to be produced.

If, for instauce, in an ordinary cryolite opalescent glass batch consisting of 30 uuits of cryolite, 46 units of carbonate of soda, 12 units of chalk, and 165 units of sand, the cryolite is replaced by 25 units of silicofluoride of sodium, and eventually 20 units of kaolin, a glass perfectly equal to cryolite opalescent glass is obtained ; the kaolin, however, is not absolutely necessary, but any other aluminiferous mineral may be substituted therefor, as it merely serves to produce a glass similar to cryolite.

Silicofluorides of alkalies may also be advantageously employed for enrichiug any opalescent glass batches. In the batch above referred to, for instance, 15 uuits of the cryolite contained therein may be replaced by silicofluoride of alkalies. The batch, which would then be composed of 15 units of cryolite, 46 units of carbonate of soda, 12 units of chalk, 165 units of saud, and 12½ units of silicofluoride of sodium, results in an opalescent glass, which is at least as good as if only cryolite had been employed.

9,715. *June 23rd*, 1890.—"Photographic Cameras." Alfred Julius Boult, 323, High Holborn, Middlesex. (A communication from Hugo Thumler, 82, Potsdamerstrasse, Berlin, Manufacturer.)

The object sought to be attained in devising this improved photographic camera is to combine the greatest possible economy with the advantages of a camera capable of being folded together in a compact form, so as to occupy a minimum of space wheu stored up for subsequent use or transport. To obtain this result the camera is preferably made solely of paper and cardboard. A bellows of cylindrical shape, made of preferably black paper impervious to light, is folded in the same manner as is usual iu the manufacture of Japanese lanterns. Into one of the folds a cardboard disc is inserted and suitably fixed by means of paste, &c. In the centre of this disc is fitted an ordinary landscape lens. A few folds of the bellows remain free in front of the disc, and the front end of the bellows is pasted on to a square plate or sheet of cardboard in such a manner as to prevent the admission of light at the joint, and in the centre of which sheet of cardboard is provided a circular aperture for the admission of light. This wall fulfils the purpose of a blind or shutter for the object glass. The opposite end of the bellows is also closed by means of a square sheet of cardboard, pasted or otherwise, attached thereto, so as to shut out all light at the joiut. This sheet or plate is externally provided with a cardboard frame, the thickness of which should be somewhat in excess of the usual thickness of the glass plates used for emulsions, and to the outer surface of this frame another plate or sheet is secured. Both the cardboard sheets at the inside and outside of the before-mentioned frame are provided with corresponding central openings, preferably of circular shape, whose size is proportioned according to the space the image is to occupy upon the negative plates. A square dry plate is inserted through the upper opening in the before-mentioned frame into a dark space provided for the purpose between the two last-mentioned sheets. The upper end of the outer sheet is extended so as to form a cover or lid, which carries on its inner side a piece correspoudiug to the portion which is wanting in the side of the frame, which side piece, when the said cover or lid is lifted, grasps the upper edge of the dry plate, so as to hold the latter in position.

To prevent access of light to the dry plate when the camera is exposed to daylight, a narrow lid of a suitable fabric or strong paper is placed upon the front edges of the cardboard sheets, while a piece or cover suspended from the said narrow lid is placed against the rearmost sheet, which is made smaller on the sides and its lower edge than the frame and the sheet at the inner side of said frame. This deficiency is supplied by strips provided on the sides and the lower edge of the cover, which strips thus effectively shut out the light around the sheet. Two india-rubber bands attached to the rear of the cardboard sheet are passed over the cover at its top and bottom parts respectively, whereby the dry plate is securely locked in position.

The bellows has a tendency to remaiu in its central compressed position, so that when it is extended beyond this normal limit it exercises a spring action upon two stops diagonally fixed by means of flexible ties, preferably of fabric, each to one side of the front of the camera, and compresses the same between the sheets, front and back of the camera. These two stops consist of cardboard strips, and are of such length that, when it is desired to obtain sharply defined photographic impressions, they extend the camera exactly to the required extent.

When upon opening the lids, and at the back of the camera a ground glass plate is inserted in lieu of a dry plate, the photographic impression received by the camera may be inspected through the wide opening in the rearmost sheet. For the purpose of throwing light upon the emulsion plate, a lid or door is arranged in front of the opening in the front plate, and adapted to be raised and lowered as desired. To enable the camera to be readily moved from place to place, all the lids are closed, and the before-mentioued stops are disconnected and swung about their flexible hinges and laid flat against the front plate. The bellows is then compressed and attached to the rear of the door which is at the back of the camera by meaus of an india-rubber band, the whole being thus made to assume a compact form. The rubber band passed over the front sheet or plate across the stops aud across the door or lid at the front of the camera, also serves to secure the latter in position, and the whole camera being by such means reduced to a portable size, may be easily carried about in the pocket or otherwise.

16,037. *October 9th*, 1890.—"Printing on Glass and Porcelain." Hermann Grauel, Paulstr., Berlin, Merchant.

This invention has for object the rapid and easy printing chiefly of label-like and ornamental designs on objects of glass, porcelain, and like materials in one or more colours. This is accomplished by means of an apparatus in which, by the turniug of a lever or frame, colour is carried by rollers from a pad to a rigid printing plate, from which the matter to be printed or impressed is transferred to au elastic plate in readiness for the printing operation.

The inventor claims :—

1. The process for printing ou flat or curved surfaces of glass, porcelain, and like materials, label-like and ornamental matter in one or more colours, consisting in so operating backwards and forwards a lever or frame carrying a plate of elastic material, that this latter is alternately moved against a printing plate containing the design, and turned over with its elastic and impressed surface ready for printing from, or consisting in so operating backwards aud forwards a lever or frame, carrying a rigid printing plate, that this latter is moved against a plate of elastic material, and away from the same, leaving the elastic plate impressed, and ready for printing from.

2. In carrying out the process referred to in the preceding claim, an arrangement for obtaining the negative picture on an elastic plate, comprising a lever or frame carrying the elastic plate, operated backwards and forwards, the elastic plate being brought in contact with a printing plate containing the matter to be printed, and a colouring roller or rollers in connection with the lever or frame, and operated by it, so as to supply colour to the printing plate after the taking of each impression therefrom.

---

The *Deutsche Photographen Zeitung* opens its New Year greeting to its readers with the announcement that the number of copies printed will be raised to three thousand.

Liverpool Amateur Photographic Association.—Applications for space in the International Photographic Exhibition must be made before the 20th inst. Full particulars will be sent on application to Mr. T. S. Mayne, Fenwick Court, Liverpool.

Boxes for Lantern Slides.—At a recent meeting of the New York Society of Amateur Photographers Mr. Beach said :— "I would like to call your attention to a new method of packing lantern slides which I have just devised. It is a method which has for its object the safe transit of slides when shipped by express. Heretofore the trouble has been that the thiu wooden grooves of the boxes would sometimes crack off aud break, and the slides iu transit would cousequently push against each other or strike each other and become cracked. Now, to avoid that, it occurred to me to make these divisions of very thin rubber, and by doing so we are able to get a thinner division, and are able to get a great many more slides in a given amount of space, and I estimate that you can pack fifty slides in eleven inches of space, whereas, ordinarily, it takes about fifteen or eighteen inches. The way this is made is simply by taking two boards that are grooved with a saw, and then these strips of rubber—rubber belting—are glued in. Another and a better way is to have a mould made and cast the rubber the same as you would a rubber mat, and I will say that I am about to have these made ; when that is done all you have to do is to tack them or glue them on to the side of the box ; then you will have it all complete, and you can throw this package around wherever you want to, aud it will not break."

# Correspondence.

## ZOOLOGICAL PHOTOGRAPHS.

Sir,—I have just read your article, page 218 in the Year-Book, and am rather surprised to learn that the list of animals I photographed nearly twenty-seven years ago contained so many, as you put it, "geuerally more uusuccessful." The photographs of many of the animals mentioned by you as failures were shown by me in the lantern at a receut meeting of the Photographic Club, and I do not think they were considered failures by those present.

You do not seem to be aware that the clouded tiger is an animal easily tamed and often kept as a pet in the East ; there my reason for not entering his cage was the true one. Considering that I did go into the enclosures or cages of many of the animals, the insinuation is uncalled for. That better work than mine ought to be done now with all the improvements in cameras, lenses, plates, and chemistry, is only natural, but I believe I may claim to have been the pioneer. I shall be much obliged by your inserting this in the Photographic News, and I think it ought also to appear in your next Almauac.

Frank Haes.

28, *Bassett Road, London, January 5th*, 1891.

## THE FIRE IN HOLBORN.

Sir,—With reference to the disastrous fire, on the evening of 5th inst., at Messrs. Stone and Co's. warehouse, adjoining our factory, 9, 10, 11, Fulwood's Rents, would you kindly allow us to state in your columns, in consequence of the numerous enquiries we are receiving, that our premises have sustained but slight damage, and not sufficient to inconvenience us materially in the conduct of our business. W. Watson and Sons.

313, *High Holborn, London, W.C., January 6th.*

---

# Proceedings of Societies.

The London and Provincial Photographic Association.

*January 1st.*—Mr. A. Cowan iu the chair. This was the first meeting held at the new quarters, the Champion Hotel, 15, Aldersgate Street, London.

The Hon. Secretary announced that Dr. P. H. Emerson had presented his new work, "Wild Life ou a Tidal Water," to the Association.

Referring to the subject down for discussion—viz., "Developers"—Mr. F. P. Cembrano said his standard developer was

| | |
|---|---|
| Pyro ... ... ... ... ... | 2 grains |
| Ammonia ... ... ... ... ... | 2 ,, |
| Bromide ... ... ... ... ... | 1 grain |

to each ounce of water. For instantaneous work, he preferred carb. soda to liq. ammonia. A useful formula he had found to be three parts of eikonogen and one part of hydrokinoue used with carbonate of potash.

Mr. A. Mackie, for studio work, would use much less pyro and bromide.

Mr. W. E. Debenham had some years ago used a very good studio developer, the formula for which was—

| | |
|---|---|
| Pyro ... ... ... ... ... | 1 graiu |
| Ammonia ... ... ... ... ... | 3 graius |
| Bromide ... ... ... ... ... | 1 grain |

to each ouuce of water. This was also a good landscape developer for suitable plates correctly exposed. On the question which was the best solution to keep the bromide mixed with, he preferred to keep the three solutions separate.

Mr. A. Mackie, for indoor work, mixed the bromide with the ammonia, but for landscape work he preferred separate solutions.

Mr. J. S. Teape, in cases of great contrast, used no bromide at all, and started development with the full amount of ammouia. Soaking the plate in plain water decreased the coutrast.

Mr. Cembrano said that he had frequently found that gelatine lantern plates increased in density during washing, after the developer had been thrown off; he used a carbonate of ammonia developer.

Mr. H. M. Hastings remarked that this developer was very rapid, and its action would probably continue until the subsequent washing had quite cleared the film.

Mr. P. Everitt had recently used acid sulphite, and had found development very slow. Was this due to the cold weather or the acid?

The Chairman was inclined to think tardy development would more likely be attributable to the weather.

A question was raised whether sulphite was used principally as a preservative for pyro, or to improve the colour of the negative. The majority of the members present used it as a preservative.

Mr. E. Clifton had kept pyro several years preserved with citric acid only.

Mr. C. H. Cooke did not believe in bromide as a restrainer; in cases of over-exposure he increased the quantity of pyro.

The Chairman said that Mr. Warnerke had recommended, in cases of plates hopelessly over-exposed, to soak them in a sixty-grain solution of bromide of ammonium for some time previous to development.

Mr. A. Haddon preferred sulphurous acid as a preservative.

---

West London Photographic Society.

*January 2nd.*—Technical meeting, W. A. Brown, president, in the chair.

The first part of the evening was spent in examining an exhibition of apparatus, the work of members.

Mr. Rogers shewed an apparatus for making lantern slides by reduction; the whole of which, including the dark slide, was constructed of pine. He also exhibited a tourists' half-plate camera and slides; both the reducing and tourists' camera were constructed by himself.

Mr. Winter explained a novel form of walking-stick tripod for hand-cameras constructed entirely of metal.

Mr. C. Whiting exhibited some prints from wet plate negatives which had been orthochromatised with erythrosine, also a very convenient revolving cutting knife for cutting out lantern masks, and a useful developing brush made of a piece of felt fixed in a wooden handle.

The annual exhibitiou of members' work, and conversazione, will take place this evening at the Broadway Lecture Hall, Hammersmith. On Saturday, the 10th., there will be an exhibition of the prize slides at 7.30.

---

The Great Yarmouth and Eastern Counties Photographic Society.

At the monthly meeting of this Society, held at the Friendly Societies' Hall, Great Yarmouth, on the 6th inst., Mr. Smith, of the Eastman Company, exhibited and explained the method of working the kodak transparent films, bromide paper, and enlarging and contact priuting.

The next monthly meeting will be held on Tuesday, 3rd February, when Mr. A. Price will read a paper entitled "Practical Photographic Notes."

---

A large number of pictures by Mr. J. P. Gibson, of Hexham, who is an excellent landscape photographer, is now on view in the rooms of the Liverpool Amateur Photographic Association.

Grained Margin on Mounts.—A grained effect may be produced on the margin of mounts, as a substitute for embossing, by the following method. Take a sheet of coarse sandpaper and cut out from the centre the size of the print which is to be mounted, allowing for an extra eighth of an inch or so between the picture and the grained surface. The sandpaper is then laid face down on the mount, which must be marked to show where the aperture falls. The marking may be done with a paper knife round the edge of a glass cutting plate. The two sheets are then placed between two pieces of stout card-board, and placed under a copying press and screwed down firmly. A few minutes' pressure will suffice.—*The Photographic Record.*

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

A. de la B. (Marcoussis).—*Petzval's Optics, &c.* 1. Professor Petzval's "Researches on Optics" were originally published by the Imperial Academy of Sciences in Vienna about the year 1858. You will find an epitome of them, occupying five pages, in the *Journal of the Photographic Society* for December, 1857. There was also an explanatory letter, signed by Joseph Petzval, in the same Journal for April, 1858, which, two months later, was answered by Herr Voigtlander. The "lens controversy," as it came to be called, engaged much attention in England at that time, and you may find frequent references to it, throughout this and the following year, printed in the above-named Journal. 2. Sir George Airy's papers all appear in the *Transactions of the Royal Society*, of which he was for many years the distinguished president. 3. Later discussions can be followed with more profit than by turning back to the old treatises of Ganot, Watts, and Balfour Stewart.

William Adcock.—A correspondent would be glad to find some one acquainted with the late William Adcock, of Melton Mowbray, who was for several years an exhibitor and member of the Photographic Society of Great Britain.

L. J.—*Photo-Mechanical Details.* See answer to "Printer" last week.

M. I. C. E.—*Theoretical Instruction.* We should recommend you to make a point of attending the Cantor Lectures on "Photographic Chemistry," which are announced for delivery, by Professor Meldola, on the 9th, 16th, and 23rd of March at the Society of Arts. In the meantime you might read up the author's previous course, entitled the "Chemistry of Photography," and published by Messrs. Macmillan and Co.

C. S.—*Mounting Enamelled Photographs.* This is always a difficult and uncertain process, on account of the stiff nature of both cardboard and photograph. We should advise you to apply the glue all over the back, and not at the edges only, and then to dry under pressure as you have been doing. A light coating of encaustic paste rubbed on the face of the print might enable you to cope with accidents such as happened to your specimen, and permit of the spot of glue being washed off without injury to the photographs. In many cases a good effect is got by mounting first and finishing off with collodion.

Luton.—*Snow as a Test of Atmospheric Purity.* Your observation is a true one, and now that the snow has been lying on the ground so long, one can see at a glance the indication of purity or otherwise of the air in different localities, by noticing the relative discolouration due to smuts and blacks which distinguishes the metropolitan from the purer deposits of snow in a rural district. The same remark applies to rain water collected in towns and open country.

Artist.—*Dedham Bridge.* The illustration of last week is a reduction of Mr. Lyonel Clark's medal picture, which was said to have been toned with palladium and intensified with silver. The sepia tone has been closely imitated in the small reproduction sent out with the News.

W. T. (Leeds).—*The Bust Portrait.* There are some American specimens, and we have seen a good result produced by Mr. Medrington, of 29, Bold Street, Liverpool. It was the head of a lady with fine neck and shoulders, loosely attired in classic drapery, and set on a short pedestal after the manner of a sculptured bust.

W. M.—We will enquire of the Editor, and let you know by post.

"Nitrate Bath" and another correspondent received as we were going to press.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1689.—*January* 16, 1891.

CONTENTS.



## ASTRONOMICAL PHOTOGRAPHY AT THE PHOTOGRAPHIC SOCIETY.

At the first meeting of the Photographic Society in its new rooms last Tuesday, Mr. Maunders read one of the most interesting papers which has been brought before the members for some time past; its subject was "Astronomical Photography." Lantern photographs in large numbers were used to illustrate the remarks of the speaker.

Among the more curious facts brought under the notice of the meeting, was the aid which photography has given in determining the velocity of some of the so-called fixed stars. Assume a star to be motionless, and to be emitting waves of light, a certain number of those waves will enter the eye in a second; suppose that star next to be approaching the spectator at high velocity, it is plain that more waves will enter the eye in a second, and if the star were to recede at high velocity, fewer waves would enter the eye in a second. This approaching or receding causes a slight shifting of the position of lines in the spectrum of the light of the star, which shifting can be both measured and photographed, and slides showing the results thus obtained by photography by the German astronomer, Vogel, had their images projected upon the screen at last Tuesday's meeting.

Vogel has given much attention to the variable star Algol, in the Head of Medusa. For a consecutive period of eight hours during about every three days, this star diminishes in brilliancy, and many have been the speculations as to the cause thereof. One of them was that possibly a planet revolving around Algol passed between the observer and that sun. Another was that dark spots of large size on Algol faced our earth at regular intervals as the star revolved upon its axis. A third was that some of the variable stars might be moving in an orbit of great elongation, so that when in one position less light reached the eye of the spectator. In regard to Algol, it is now clear that the falling off of the light is due to some dark body coming between the star and the earth, and recent researches on the lines we have already stated have proved Algol to have a relative orbitual motion of its own. The result of Vogel's researches is, that he has been able to give the size and the weight of the planet revolving around Algol, although the planet has never been seen, and probably never will be visible to the human eye.

The stars are suns more or less like our own sun, but appear small because of their immense distance, a distance so great that it takes some years for the light to travel from even the nearest of them to the earth; consequently, when we gaze at the heavens by night, we see the stars, not as they are now, but as they were some years ago. As our own sun has a few large planets revolving around it, the natural assumption is that the other suns possibly also have planets revolving around them, but that these dark little bodies should become visible to us at the vast distance of the fixed stars seems to the scientific world to be for ever impossible.

Photographs of the sun and of various solar phenomena were exhibited, including some magnificent representations of sun spots, and of the general mottling of the solar surface. In this, as in most other cases, the speaker did not stop to explain the supposed causes of the facts pictured, or his paper would have been of increased interest; time was short, and his lantern slides were many. A popular scientific theory of the cause of the spots on the sun is, that they are due to the down-rush of a comparatively cool absorbing atmosphere. The heat of the sun is so great that even metals are raised into the gaseous state, and these gases, when somewhat cooled, are supposed to shower down towards the centre of the sun as luminous molten rain.

Various photographs of the great nebula in Orion—some taken by Mr. Common, and others by Mr. Roberts—were also projected upon the screen; the best photograph obtained by Mr. Common was not among them, but the set included one not far short of it in quality. The distance of this nebula is so great, that one astronomer has calculated that, if there be no absorption of light in space, the light from the nebula cannot travel to our earth in less than sixty thousand years.* When such circumstances as these are considered, and when it is remembered what myriads of suns can be seen lavishly scattered like luminous dust in space, man feels his own insignificance, and is raised, for the time, above thought of the mean aims and low ambitions of earth; he can somewhat realize how, before the gaze of the Eternal, "ages likes flies in summer heats pass by," and can feel in sympathy with the dream of the poet:—

"God called up from dreams a man into the vestibule of Heaven, saying, 'Come thou hither, and see the glory of my house.' And to the servants that stood around his throne he said, 'Take him, and undress him from his robes of flesh: cleanse his vision, and put a new breath into his nostrils; only touch not with any change his human heart—the heart that weeps and trembles.' It was done; and, with a mighty angel for his guide, the man stood ready for his infinite voyage; and from the terraces of Heaven, without sound or farewell, at once they wheeled away into endless space. Sometimes with the solemn flight of angel wing they fled through Zaarahs of darkness, through wildernesses of death, that divided the worlds of life; sometimes they swept over frontiers that were quickening under prophetic motions from God. Then, from a distance that is counted only in Heaven, light dawned for a time through a sleepy film; by unutterable pace, the light swept to *them*; they, by unutterable pace, to the light. In a moment the rushing of planets was upon them; in a moment the blazing of suns was around them.

"Then came eternities of twilight, that revealed, but were not revealed. On the right hand and on the left, towered mighty constellations, that, by self repetitions and answers from afar, that, by counter-positions, built up triumphal gates, whose architraves, whose archways rested, rose at altitude by spans that seemed ghostly from infinitude. Without measure were the architraves, past number were the archways, beyond memory the gates. Within were stairs that scaled the eternities below; above was below, below was above, to the man stripped of gravitating body: depth was swallowed up in height insurmountable—height was swallowed up in depth unfathomable. Suddenly, as thus they rode from infinite to infinite—suddenly, as thus they tilted over abysmal worlds, a mighty cry arose, that systems more mysterious, that worlds more billowy, other heights and other depths, were coming, were nearing, were at hand.

"Then the man sighed, and stopped, shuddered, and wept. His overladen heart uttered itself in tears; and he said, 'Angel, I will go no farther; for the spirit of man acheth with this infinity. Insufferable is the glory of God. Let me lie down in the grave, and hide me from the persecution of the infinite; for end, I see, there is none.' And from all the listening stars that shone around issued a choral voice, 'The man speaks truly: end there is none, that ever yet we heard of!' 'End is there none?' the angel solemnly demanded: 'Is there indeed no end? and is this the sorrow that kills you?' But no voice answered, that he might answer himself. Then the angel threw up his glorious hands to the Heaven of Heavens, saying, 'End is there none to the universe of God. Lo! also there is no beginning.'"

---

Torquay Photographic Association.—The monthly meeting was held at St. Winifred's on Tuesday evening, 13th, when a paper on "Platinotype" was read by Mr. Geo. Edwards. Afterwards some successful experiments in development were made.

Mr. Crookes:—Mr. William Crookes, who was the editor of this journal at the time of its foundation, and an active worker in photographic research, has been elected president of the Institution of Electrical Engineers, and last night delivered an able and interesting presidential address to the members. Its subject was "Electricity *in transitu*: from plenum to Vacuum."

* *The Orbs of Heaven.* O. M. Mitchell, A.M., Director of the Cincinnati Observatory.

## ON PAINTING A PLAIN BACKGROUND.

In an article last week on "Backgrounds and Accessories," we remarked upon the notable improvement which has taken place in the choice and use of such aids to photographic art, and traced that improvement to the culture which has been acquired by workers owing to the rapid progress in artistic knowledge generally in this country. The educated photographer of to-day knows well enough that he can produce with a plain background a far more artistic effect than he can by hanging behind his sitter a meritricious landscape or palatial interior, and that, by shading portions of such a plain background, and by illuminating other portions, as can easily be done by a few simply arranged curtains and reflectors, he can produce all those effects of light and shade which are attained by the best artists in oil colours. The simplest kind of plain background can now be purchased in the form of fabric of convenient width and in any tone of colour which the photographer may desire. A woven material has also been introduced, in which a gradual shade from light to dark is brought about in the operation of weaving. In another form of shaded background the base is of paper, while the shading is produced by lithographic printing. So that it will be seen that the worker has his choice of several kinds of backgrounds.

But there are many photographers who hardly believe in anything unless it be their own handiwork and home-made, and for such workers we have a great respect, for from them come the little inventions and clever notions which are so valuable to the fraternity at large. Such a man will take a delight in making for himself that which often it would cost him less to buy, even when he does not take his own labour into account. Still he is happier for having done the work himself, is proud of his achievement, and sleeps the sleep of the just with that feeling of "something attempted, something done" which, according to Longfellow, makes the lot of a village blacksmith such a happy one.

But although a man can do many things in the way of simple and ordinary carpentry—such as fitting up shelves, making boxes, picture frames, and the like—he generally experiences an utter failure in his first attempts at making and painting a background. And the reason of this is not far to seek. The work is of an unusual character, and embraces certain technicalities which an amateur cannot very well get a mastery of, unless he have an opportunity of getting behind the scenes; and we use the term in its most literal sense, for the operation of painting a background for photographic purposes is akin to that of painting a scene for a theatre. If, then, we can learn a little regarding the materials employed in theatrical work to produce such wonderful illusions on the stage, we shall soon conquer the difficulties involved in painting a background.

The best course for the tyro to pursue is to attempt at first nothing but a plain background in one even tint of monochrome. Seven feet by six is a serviceable size, and he will require a strong wooden frame of these dimensions to serve as a temporary support for the material upon which he works. Good, strong, unbleached calico two yards wide must be tacked on to this frame, so that it presents an even flat surface free from ruck or wrinkle. A little art is necessary here: first, the four corners must be secured, taking care to stretch the material well from the centre as each tack is driven home; the tacking down of the edges is then a mere matter of detail. The cloth must next be *primed* with very thin glue, and allowed to dry, after which comes the colouring process. It is in the mixing and application of this distemper colour where the amateur worker is apt to fail. As a rule, he is in such a hurry to see the effect of his work that he will not take sufficient time for his colour to get cold. The drying of the priming coat will, however, take several hours even in a warm and dry atmosphere, and he should mix his colour immediately after the priming has been laid in.

Take a couple of balls of ordinary household whiting, place them in a basin or clean pail, and pour upon them enough water to reduce them to a viscid mud. Stir with a wooden spoon until this white mud is perfectly free from lumps, and then add colour until the required tint is attained. Lamp black, or drop black, and burnt umber, both ground in water, can be obtained of most artists' colourmen, and small pieces of the soft pasty tints must be added at a time, and well incorporated with the whiting by the aid of the spoon. But a word of caution is necessary here as to testing the colour from time to time, in case it should be made too light or too dark in tone. A little of the wet mass must be brushed on a card, and dried before the fire, before the tyro can judge of the tint, for all distemper colours are several shades darker when they are wet than when they are dry. When the right tone is reached, add to the contents of the vessel half a pound of patent size, which has been previously melted on the fire, in a pint of hot water, and stir up the colour most thoroughly. When this has been done, put the vessel away in a cold place.

At the end of some hours, when the colour has become perfectly cold, it will assume the form of a thin jelly, and it is now in a fit state to be laid on the primed cloth. A broad, flat white-wash brush, known as a *two-tie*, is the tool to use in applying the colour to the cloth. The colour must be laid in firmly, first in vertical, and then in horizontal strokes of the brush, the latter crossing the former. The work should be done expeditiously, a couple of square feet at a time, until the whole surface is covered. The result will be, if these directions are closely followed, a smooth, even surface of monochrome, which, when removed from its temporary supporting frame, can be attached to a roller, and thus preserved from injury when not in use. When the beginner has succeeded in this elementary lesson in distemper painting, he will, no doubt, be wishful to do something of an artistic kind; but he will do well to learn to walk before he attempts to run.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Two Quinol Developers—Brown and Reddish Tones on Bromide Prints by Eikonogen Development.

*Two Excellent Quinol Developers.*—The following developer, which is recommended by Mr. F. Wilde, in the *Photographisches Wochenblatt*, is said to bring out all the details in the weakly exposed parts of the plate, and to act very energetically, giving at the same time sufficient density.

*Solution* No. 1.

| | |
|---|---|
| Water ... ... ... ... ... | 250 c.c. |
| Sodium sulphite ... ... ... ... | 60 grammes |
| Cryst. citric acid ... ... ... ... | 5 ,, |
| Pyrogallic acid ... ... ... ... | 20 ,, |

*Solution* No. 2.

| | |
|---|---|
| Quinol ... ... ... ... ... | 10 grammes |
| Alcohol ... ... ... ... ... | 200 c.c. |

*Solution* No. 3.

| | |
|---|---|
| Water ... ... ... ... | 1,200 c.c. |
| Sodium sulphite ... ... ... | 100 grammes |
| Soda ... ... ... ... | 300 ,, |

Just before use are mixed—

| | |
|---|---|
| Solution No. 1 ... ... ... ... | 8 c.c. |
| Solution No. 2 ... ... ... ... | 8 ,, |
| Solution No. 3 ... ... ... ... | 34 ,, |

The action of the developer may be still increased, and the time of exposure shortened for one-third of the otherwise required time, if to the above quantity of the mixture about twenty drops of the following solution are added:—

| | |
|---|---|
| Hyposulphite of soda ... ... ... | 5 grammes |
| Potassium bromide ... ... ... | 20 ,, |
| Water ... ... ... ... ... | 1,000 c.c. |

In cases where it is admissible to allow to the negative a somewhat longer time for development, the above mixture may be diluted with an equal quantity (50 c.c.) of water.

Another hydroquinone developer, very well suited for instantaneous exposures, has been recommended of late, according to the *Photographisches Archiv*, by M. Balagny.

The following two solutions are prepared:—

*Solution* No. 1.

| | |
|---|---|
| Boiling water ... ... ... ... | 1,000 c.c. |
| Sodium sulphite ... ... ... ... | 250 grammes |

When dissolved, add—

| | |
|---|---|
| Quinol ... ... ... ... ... | 20 grammes |

The solution is stirred until the quinol has completely dissolved. After cooling down the solution is poured into a glass bottle, which is then stoppered.

*Solution* No. 2.

| | |
|---|---|
| Water ... ... ... ... ... | 900 c.c. |
| Caustic soda ... ... ... ... | 100 grammes |

When dissolved, the following solution is added:—

| | |
|---|---|
| Water (warm) ... ... ... ... | 100 c.c. |
| Ferrocyanide of potassium ... ... | 10 grammes |

The latter gives to the negatives softness, and preserves the whites. Besides, a third solution should be kept in stock, consisting of—

*Solution* No. 3.

| | |
|---|---|
| Water ... ... ... ... ... | 100 c.c. |
| Potassium bromide ... ... ... | 10 grammes |

This is only required in the case of a freshly prepared bath. To develop an instantaneously exposed plate of half-plate size, mix—

| | |
|---|---|
| Solution No. 1 ... ... ... ... | 80 c.c. |
| Water ... ... ... ... ... | 40 ,, |
| Solution No. 3 ... ... ... ... | 1 ,, |

The plate is placed on the bottom of a glass dish, and the above mixture poured over it. It is allowed to act for about half a minute. Then, in a glass measure, 2 c.c. of solution No. 2 are poured, which are mixed with the bath in the dish, and in which the plate is again placed. After a few seconds again 2 c.c. of solution No. 2 are added, and so on, until the image begins to appear. As soon as it is faintly perceived, the addition of the alkaline solution should be interrupted; only, if it is noted that the plate has been under-exposed, the solution No. 2 should be added also after the high-lights have appeared, but always only 2 c.c. of it at one time. After development the plate is well washed, and then placed for half a minute in a solution of

| | |
|---|---|
| Tartaric acid ... ... ... ... | 25 grammes |
| Water ... ... ... ... | 1,000 c.c. |

which prevents the negative turning yellow in the fixing bath. The plate is again well washed, and then fixed in a 20 per cent. solution of hypo. To develop a time exposure, the bath is prepared as follows:—

| | |
|---|---|
| Water ... ... ... ... ... | 80 c.c. |
| Solution No. 1 ... ... ... ... | 40 ,, |
| Solution No. 3 ... ... ... ... | 4 ,, |

The further treatment is the same as with instantaneous exposures. If the bath becomes weak, after a larger number of plates have been developed in it, it may, notwithstanding, be used if prepared as follows:—

| | |
|---|---|
| Old solution ... ... ... ... | 100 c.c. |
| Solution No. 1 ... ... ... ... | 25 ,, |

and if, as described above, 2 c.c. of the alkaline solution are added at one time.

*Brown and Reddish Tones on Bromide Prints by Eikonogen Development.*—Dr. F. Stolze, editor of the *Photographie Nachrichten*, publishes in the columns of that journal a very practical and useful process of producing warm tones on bromide prints by the use of the eikonogen developer, combined with a modification of the tone of the deposit in the finished print. For the first development he uses an eikonogen developer of the following composition:—

*Solution* No. 1.

| | |
|---|---|
| Sodium sulphite ... ... ... ... | 20 parts |
| Eikonogen ... ... ... ... | 4 ,, |
| Dist. water ... ... ... ... | 300 ,, |

*Solution* No. 2.

| | |
|---|---|
| Carbonate of potash ... ... ... | 50 parts |
| Dist. water ... ... ... ... | 300 ,, |

In the case of normal negatives, 50 parts of solution No. 1 are mixed with 20 parts of solution No. 2, and with 150 to 180 parts of dist. water. In the case of soft negatives more of solution No. 1 is taken, whilst in the case of hard negatives, the bulk of solution No. 2 and of the water should be increased. The temperature of the solution should be at least 59° to 60° F. In the case of over-exposure from soft negatives, 10 to 25 drops of a solution of potassium bromide 1:10 should be added to 100 c.c. of the above mixture. By this means very agreeable, slightly yellowish-brown tones are obtained. In order to produce brown or reddish tones, it is, however, necessary to modify the tone of the finished print, which is done by transforming the silver image into bromide of silver, and by re-developing it with eikonogen. For this purpose the following two solutions are prepared:—

| | | |
|---|---|---|
| A.—Sulphate of copper ... ... ... | | 1 part |
| | Dist. water ... ... ... ... | 100 parts |
| B.—Potassium bromide ... ... ... | | 1 part |
| | Dist. water ... ... ... ... | 100 parts |

The two solutions are mixed, and the prints are bleached in the mixture. They are then washed five to six times, to remove the copper bromide as completely as possible. The prints are then, in daylight, treated with the above eikonogen developer, which for this purpose is composed as follows:—

| | |
|---|---|
| Solution No. 1. ... ... ... | 50 parts |
| Solution No, 2. ... ... ... | 20 ,, |
| Dist. water ... ... ... ... | 4,930 ,, |

The action is, of course, very slow, but entirely uniform. The tone is passing from a very vivid red-chalk tone through all shades of reddish-brown and blackish-red to a dark violet black. To prevent the toning process continuing in the washing water, the prints are placed in a bath of—

| | |
|---|---|
| Citric acid ... ... ... ... | 1 part |
| Water ... ... ... ... ... | 100 parts |

They are then again washed, and dried. According to the degree of the second development, the character of the original picture must be a different one. In order to obtain a red-chalk tone, the picture should be a little over-developed, so that all the tender half-tones are too dark without the shadows being, however, too heavy. For darker tones the original picture should always be of a greyer tone, and the high-lights should appear entirely white, even slightly devoid of details. During the second development all these apparently wanting tones will make their appearance. This method may, therefore, be used in the case of quite flat original pictures in order to intensify them successfully. It is necessary to free the prints completely from the developing solutions by washing, to prevent their turning yellow afterwards. This process is at the same time an excellent means for intensifying flat negatives.

## THE RESTORATION OF DARKENED EIKONOGEN.

An evil complained of a great deal in the development with eikonogen is the circumstance that the eikonogen will change soon if proper care is not taken; that is, it will become brown and be useless for developing solutions. We have been asked the question repeatedly: Can eikonogen, after it has become brown, be restored again so as to be fit for use? and in view of this really favourite developer, it will certainly be of general interest to discuss this question a little closer.

It may be remarked beforehand that it is possible to make the changed eikonogen useful again, and in different ways. For instance, by the following process: Prepare a not very concentrated solution of sulphite of soda, and add to the same one-half the weight of eikonogen to be so treated. If the solution is alkaline, it is neutralised and made to boil in a glass flask. After this the rest of the eikonogen is added, and the cooking is continued until the eikonogen is completely dissolved, or nearly so. In the beginning only enough liquid should be taken to make the solution saturated; it is also good if a little of the eikonogen remains undissolved. The proportion may, for instance, be 500 c.c. sulphite solution to 90 to 100 grams of eikonogen. The solution is then cooled off quickly by stirring it with a glass rod to accelerate crystallisation. A powdery deposit will form, from which the coloured liquid can be separated by decanting. This deposit is finally washed with cold alcohol, and dried at a moderate heat.

In this manner an almost colourless product is obtained, which is applicable again for developing solutions. For the practical photographer this process is somewhat complicated. We recommend, therefore, a trial of the following method by A. Pétry, which is much simpler :—

Dissolve the brown eikonogen cold or with application of heat in the proportion of 20 grams to 500 c.c. of ordinary water. If warm water is used the solution should cool off. On the other hand, dissolve 50 grams tartaric acid in 1 litre of ordinary water. Of this solution take 150 c.c., and pour the same gradually (4 to 5 c.c. at once) into the eikonogen solution under continual stirring with a glass rod. The solution, which in the beginning is of a dirty dark-red colour, assumes gradually a garnet-red colour. It thickens very quickly, and has then the appearance of a slightly light pink-coloured paste. This is put into a glass funnel with a sufficiently large paper filter. The discharged water is of a more or less intensely red colour, according to whether the eikonogen was more or less changed. If a few cubic centimetres of the above tartaric acid solution are added to this liquid, it will darken and form a new precipitate, which is filtered. The precipitate is then washed several times with the rest of the tartaric acid solution, and left to drain. Finally, the filter paper is removed from the funnel, spread upon two or three sheets of blotting paper, and left to dry in an airy place, which should not be too light.

The whole operation is finished in thirty minutes, and all the apparatus necessary is generally in the possession of every photographer.

The dry deposit can be easily removed from the filter paper, and has the shape of fine scales of a pinkish colour, does not change in the open air, cannot be dissolved in water, but is easily soluble if sulphite of soda is added to the water. The crystallised scales are easily reduced to powder by a light pressure. To save time in making the developer the powder may be changed to pellets, each pill containing 1 grain powder.

Mr. Pétry calls this product oxidised eikonogen. The question whether it pays to change the original eikonogen with another product, he answers decidedly in the affirmative. It is not only, in case of need, practical, he says, but the oxidised eikonogen has also always the advantage of dissolving cold completely in water containing sulphite of soda, and that there is no weighing and no heating required by application of the same in the shape of pellets of a definite weight.

Pétry gives also the following developing solution :—

| | |
|---|---|
| Sulphite of soda (pure) ... ... ... | 30 grams |
| Oxide of eikonogen ... ... ... | 5 ,, |
| Carbonate of soda ... ... ... | 50 ,, |
| Water ... ... ... ... ... | 500 c.c. |

The sulphite of soda is first dissolved in water, the oxidised eikonogen is then added, and after it has dissolved, the carbonate of soda, reduced to a powder, is added. The bath, even in an open tray, should keep well for several days, and give well coloured negatives with good details. In case of necessity, a few drops of a 10 per cent. bromide of potassium solution may be added.

We remark, finally, that the above-mentioned precipitate can also be obtained with muriatic acid, sulphuric acid, and nitric acid, in place of the tartaric acid.—*Photographisches Archiv.*

---

The Photographic Club.—Wednesday, January 21st, "Photography" (American Slides); January 28th will be Annual Lantern and Musical Entertainment.

## THE CAMERA AND ITS VARIOUS MOTIONS.

BY PROFESSOR W. K. BURTON, C.E.

### Chapter V.—Hand Cameras, Stereoscopic Cameras.

One thing in which I find it possible to agree with Dr. Emerson is that the expression "detective camera" is an objectionable one, as applied to cameras intended to be put to the use that is made of cameras sold under that name. The idea that amateur photographers—or any photographer, for the matter of that—should go about taking photographs of people when these object to the operation—the idea distinctly conveyed in the term "detective photography"—is most offensive; but it should be borne in mind that, when the term "detective camera" was first applied, the idea was that cameras of the kind so described would actually be used by the detective force, and that this was the origin of the term.

As I have already said, there are such multitudes of hand-cameras at the present day—scarcely a week, apparently, passing but a new design is put on the market—that it would be impossible to describe them all. I, therefore, only say a word or two on general principles.

The hand-camera being a "one lens camera," it is scarcely possible to consider the camera entirely apart from the lens.

So much has recently been written of the advantages of long-focus lenses—long in relation to the size of the plate, that is—that it is not necessary to say more on the subject, but that the advantage holds good *at least* as much in the case of a hand-camera as in the case of others. The lens should also be capable of working at a large aperture; if possible, No. 2 of the U.S.

Of the various advantages of different details of construction of hand-cameras, the purchaser must be his own judge. There is scarcely any structural advantage that does not bring with it at least some little drawback, and it is often difficult to decide whether the advantage is gained at too great a price or not. To take an example or two. It is certainly an advantage to have a fairly large size of camera; but, with increase of size, there comes, besides increase in bulk and weight, very great increase in the optical difficulties met with, especially in the matter of reduced depth of focus, and the number of possible subjects is thus greatly diminished. The advantage of having the plates—a supply of, say, a dozen—within the body of the apparatus, instead of in separate dark slides, cannot be denied; but the weight, bulkiness, and complication of the apparatus are thereby of necessity increased. Finders are of undoubted use—in some cases, at least—but they add to the expense of the camera, if not to the weight and bulk.

One arrangement that will, I think, be quite generally admitted as peculiarly adapted to use with hand-cameras is the roll-holder, especially when filled with continuous rolls of the new celluloid films.

Such motions as vertical or horizontal swing-backs, sliding fronts, &c., are not, I think, at all necessary or desirable in the case of hand-cameras.

*Lenses of "Fixed Focus."*—This is a matter that has been considerably discussed of late, and that deserves a word or two. The term "fixed focus," as applied to a lens, in as far as it has any meaning at all, means that all planes of any subject likely to be photographed with it will be in focus without adjusting the distance between the lens and ground glass, or, in other words, without focussing; and farther, to all intents and purposes, in connection with hand-camera work, it means that the lens should display these properties whilst working with a large angular aperture—say $f/8$ at least.

Strictly speaking, this property does not exist at all; but, in the case of some lenses, so near an approach to it exists that none of the planes in any subject likely to be photographed will be perceptibly, or at least offensively, out of focus. A mistake, however, that seems sometimes to be made, is to suppose that the qualified "fixed focus" that I now describe can be got by the adoption of some particular *form* of lens, whereas it depends *solely* on the focal length and the aperture.

In a communication on "Depth of Focus" that I sent to the PHOTOGRAPHIC NEWS some time ago, the optical part of this question was fully discussed. Here I shall only give a short description of the way in which a hand-camera should be adjusted so as to get the best effect with a fixed focus.

A distant object should be focussed for, and the camera should then be extended till it is seen that this distant object is just out of focus, or, if the full aperture of the lens be $f/8$, as it most commonly is, the camera should be extended $\frac{1}{50}$th to $\frac{1}{32}$th of an inch beyond the position of best focus.

To give an idea of the practical result of adjusting a camera in this way, I may give the following figures; taking a set of lenses such as are likely to be used for hand-cameras, the assumption being that all are used at $f/8$.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| With a focus of | 4 ins., | the object | in best focus | will be | about | 17 | ft. dist. |
| ,, | 5 | ,, | ,, | ,, | ,, | 26 | ,, |
| ,, | 6 | ,, | ,, | ,, | ,, | 38 | ,, |
| ,, | 7 | ,, | ,, | ,, | ,, | 52 | ,, |
| ,, | 8 | ,, | ,, | ,, | ,, | 67 | ,, |
| ,, | 10 | ,, | ,, | ,, | ,, | 100 | ,, |

Whilst objects at *half* these distances will be only just perceptibly out of focus from being too near the camera. It may be said, roughly, that no adjustment is needed for quarter-plate cameras; that adjustment is not needed in the case of 5 by 4 cameras, for the majority of work; and that a very considerable deal of work might be done, even with half-plate cameras, without adjustment.

It is to be noted that there is no necessity for achromatisation in the case of lenses used with fixed focus, if an adjustment of the camera be made corresponding with the difference of the visual focus, and of the focus of the chemical rays.

A deal of ingenuity has been spent in so designing hand-cameras that the fact that they *are* photographic gear is concealed. They are made in the form of boxes, hand-bags, parcels; like watches, to go within the waistcoat, the lens protruding through a button-hole; and in a multitude of other forms besides. There can be no doubt that this concealment may be useful for some kinds of work, although it always gives rise to suspicion of that kind of *detective* work that was condemned at the beginning of this chapter; but it is surprising how much the greater part of the work commonly done by hand-cameras, specially made, can be done with an ordinary small camera of the best make, with a good lens and instantaneous shutter. All that is necessary is to know that everything is *absolutely* light-tight. In exposing, the camera is held in the hand, and "aiming" may be done by any simple sighting arrangement fixed to the camera, or even by looking along one of the edges of the baseboard. As an example of the way in which a common camera may be used for hand work, I may be allowed to describe the arrangement I use myself. This is simply a quarter-plate camera of what I consider the best English make, with a rectilinear lens working at a maximum aperture of No. 2 U. S. (a little more than $f/6$). The camera was first of all adjusted in the following way: A distant object was focussed with the greatest sharpness under an eye-piece. and from the position of the camera thus fixed, the lens was racked out $\frac{1}{16}$ inch. A peg was fixed so that, without removing it, this was the farthest that the camera could be racked in. The camera is now so adjusted that, used with the full aperture of the lens, the distance will be just perceptibly out of focus—an object at a distance of about fifty feet will be in the sharpest focus (the focal length of the lens being about six inches), and everything up to within a little more than twenty feet off will be in at least fairly good focus.

A set of marks have also been made so that, with smaller stops, by adjusting to the different marks, the condition of always having the distance just a little out of focus shall be fulfilled. The marks are made so that the lens is racked out from the position of sharpest focus for a distant object, the following distances for the following stops. The list includes the full aperture, No. 2, already mentioned:—

| | | | | | | |
|---|---|---|---|---|---|---|
| For No. 2, $\frac{1}{16}$ inch | when an object about | 50 ft. off | will be in best focus and one | 25 ft. off | will still be in fair focus. |
| ,, No. 4, $\frac{1}{25}$ ,, | ,, | 38 ,, | ,, | 19 ,, | ,, |
| ,, No. 8, $\frac{1}{8}$ ,, | ,, | 25 ,, | ,, | 13 ,, | ,, |
| ,, No. 16, $\frac{1}{8}$ ,, | ,, | 19 ,, | ,, | 10 ,, | ,, |
| ,, No. 32, $\frac{1}{4}$ ,, | ,, | 13 ,, | ,, | 7 ,, | ,, |

*Stereoscopic Cameras.*—I entered—if not fully, at least sufficiently to give a general idea of the subject—into stereoscopy generally in the series of articles on optics that I communicated to the PHOTOGRAPHIC NEWS some time ago, and almost anything that I could say here would be little more than repetition of what I said before.

The greatest distance commonly met with between the human eyes is about $2\frac{3}{4}$ ins., and theoretically there should be no greater distance than this between the lenses of a stereoscopic camera, and the length of the plate should be limited to $5\frac{1}{2}$ inches. In practice, however, a larger size than this is always used, the lenses being correspondingly separated. The largest size of plate, so far as I know, ever used with the common stereoscopic camera is 8 by 5, involving a distance of four inches between the lenses. I think, however, that such a distance should be avoided, as, at least in the case of any near objects being included, an effect of exaggerated stereoscopy is liable to be produced; 7 by 5 inches is a better size, and $6\frac{1}{2}$ by $4\frac{3}{4}$, or $6\frac{1}{2}$ by $4\frac{1}{4}$, probably better still.

Many stereoscopic cameras are so made that, removing a central division, and substituting a front with one lens flange for that with two, the camera can be used for ordinary photography on the whole size of the plate.

In doing stereoscopic work with modern dry plates, a shutter for giving an exposure simultaneously with both lenses is almost an essential, and this shutter should be capable of giving a "time" as well as an instantaneous exposure, otherwise, in addition, a flap uncovering and covering both lenses simultaneously will be needed for giving exposures of from, say, half a second upwards.

---

WHITE mackintosh with a matt surface is proposed as a screen for the lantern; its chief advantages are its opacity, thinness, and freedom from liability to crack when rolled,

## A NEW HAND CAMERA.

Messrs. Mawson & Swan have exhibited to us a new hand-camera of Dutch origin, manufactured by Messrs. Loman & Co., of Amsterdam, and which possesses two leading features, one of which is that the theoretically excellent roller blind shutter next the plate is employed, and the other is that the image to be photographed is seen of full size and in sharp focus the instant before making the exposure. Variations of focus can be made by the aid of the ground glass screen.

The camera is made in different forms, the simplest of which is pictured in fig. 1. A plane mirror, not shown in the cut, normally rests at an angle of 45°, and reflects on to the ground glass at the top in the old camera-obscura fashion. It has also one of the old-fashioned shades which, when not in use, lies flatly on the top of the ground glass.

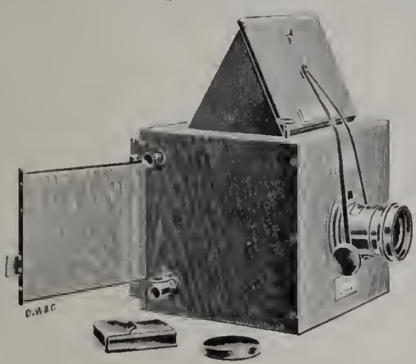


*Fig.* 1.

When the image is in true focus upon the screen, it is in equally true focus on the plate when the mirror is removed. The roller-shutter behind the mirror can be set to any speed. The lens, in the camera of this pattern, is a rapid rectilinear, fitted with rack-and-pinion.

Fig. 2 represents a camera of the same class, but more expensively finished. The lens is inside, and works at *f* 5·6, and we are told that it gives good definition even at this aperture, and, as it has an iris diaphragm, smaller apertures can be used if required. The instruments are worth examination by those who are selecting a hand-camera, and they present some features which are theoretically good, and should be of practical value.

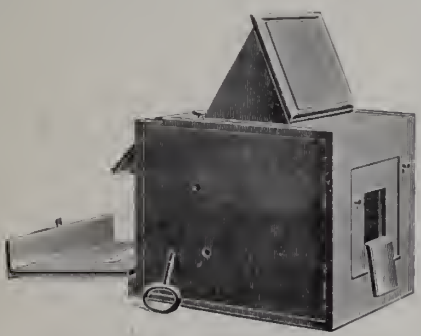


*Fig.* 2.

Reproduction of Positives in Original Size.—When the bellows of the camera which we have at our disposal does not give us the required size, one may proceed as follows: Place in the pressure-frame an ordinary gelatino-bromide dry plate, then immediately the original on top, so that the image be in direct contact with the sensitive film. It goes without saying that if the print has been stuck on a mount it must be removed from it. Place over the whole another glass plate, then expose in such a manner that the light only reaches the sensitive plate after having passed through the glass and the print. The exposure lasts in diffused light from one-half second to five seconds. The negative is developed as usual, and we obtain a perfectly sharp reproduction without a shadow of granulation, as might be feared, on account of the interposition of the paper.—*Der Amateur Photograph.*

## MOULDING PHOTOGRAPHIC LENSES.

A communication from the Glastechnisches Laboratorium, Schott and Gen., in Jena, published in the *American Journal of Photography*, deals with the influence of the process of cooling upon the optical properties of glass, and the production of pressed lenses in a thoroughly annealed state, and says that the very imperfect state of annealing generally met with in the glass-discs for larger telescopes formed for years a constant source of complaint from opticians who, in the manufacture of large-sized lenses, are working strictly spherical surfaces. For this and other reasons, it has been our aim ever since the erection of our works to improve the process of annealing. The method hitherto in use, viz., that of allowing the temperature of the red-hot glass to fall in a kiln completely enclosed by brick-work, which gradually transmits the heat stored up in it to the surrounding atmosphere, has been discontinued by us in all cases where high optical properties are aimed at, and in its place we adopted the plan of storing the glass in a vessel the temperature of which may be accurately measured, and subjected to a very slow and strictly uniform decrease, the duration of which may be adjusted to suit special requirements.

The experimental researches which formed the necessary predecessors of our new process of annealing, offered ample opportunity for minutely studying the influence of internal strains and pressures upon the optical properties of the glass. We intend to treat *in extenso* on this subject at a later date; here it may suffice to mention the most important of those results which will interest practical opticians:

1. Any kind of glass becomes strained—*i.e.*, the molecules of the glass are subjected to tension—unless the process of solidification be extended over a very long period.

2. The refractive index of one and the same piece of the glass varies according to the duration of the process of annealing; this diversity may extend to several units of the third decimal place.

3. If a lens or circular disc, on being carefully examined by means of polarised light, be found to yield a regular black cross, which remains perfectly free from any distortion during a complete rotation of the disc about the optic axis, it may be inferred that the tension is strictly regular throughout the entire piece of glass under examination. The presence of a moderate tension of this kind has no other effect as if there were a slight gradual diminution of the refractive index in the direction of of the axis. Owing to the symmetrical arrangement of the tensions round the axis, they do not exercise any detrimental influence on the image.

4. If, however, a lens or circular disc, while being turned round its axis under examination in polarised light, show in any one or several positions a displaced black cross or any other irregular figure, the tensions must be considered to be irregular. The influence of such tensions dissymmetrically grouped round the axis is identical to that of a difference of the refractive power in different parts of the lens. Glasses of this kind should never be employed for the manufacture of large-sized objectives. With telescopic lenses made of glass where this defect existed in a moderate degree, many opticians attempt to compensate this differentiation of refraction by introducing at random deviations from strictly

spherical surfaces through polishing, with the result of thus obtaining pretty satisfactory images.

By means of our method of annealing, we have succeeded in producing discs for object-lenses having a diameter up to 35cm. nearly perfectly free from tension ; the entire surface of the disc being made to become efficient under the polaroscope. All that is necessary during the test is to exclude any differences of temperature of the discs, as these are apt to give rise to temporary tensions. Nearly all discs annealed according to the older system show the distinct black crosses characterizing the presence of strain and pressure, even in those cases where the diameter of the discs does not exceed 2 cm.

Though it must be admitted that many opticians, before grinding large-sized lenses for telescopes, will ascertain the properties of the glass with respect to annealing, yet we know from experience that there is considerable inclination to underrate the serious effects of tension, and that many go so far as to consider examination before or after making a lens hardly worth the trouble.

We append to these lines a sketch of an apparatus, the principle of which is due to Prof. Mach, of Prag, which may be readily put up, and by means of which plane plates (fig. 2) or positive lenses (fig 1) may be tested. The apparatus must be adjusted in such a manner that with parallel nicol prisms the eye at $E$ sees the lens or disc to be tested fully illuminated ; if now the nicol prisms be crossed, total extinction will take place with glasses having no internal tensions, whereas with imperfectly annealed glasses the well-known figures indicative of tension will present themselves.

In order to examine the figures due to strain or pressure in all positions of the prism with respect of the disc of glass, it will be found advantageous to turn both prisms synchronically rather than to turn the discs themselves, as these, owing to the touch of the warm hand, may become locally heated.

In order to better distinguish the present new method of annealing from that hitherto in use—raw annealing—we have introduced the term "fine annealing" when referring to the former.

Our experiments and improvements made with regard to the process of glass-annealing, have induced us to adopt for our fabrication the well-known plan, worked in Paris for many years, of moulding the glass by means of pressing it while in a semi-liquid state between metal cups having as nearly as possible the same curvatures as the lens. Lenses produced in this manner are utterly useless for application in better class instruments if the ordinary quick process of annealing be employed, as the internal strain in the glass will generally be very great, and sometimes may become so excessive as to cause the rough lens to fly into small pieces as soon as an attempt is made to grind it. However, with our new method of annealing, which permits of annealing at such low temperatures as to put deformations out of the question, ready means are furnished to produce lenses of this kind entirely free from internal strains by subjecting them, after having allowed them to cool down, to a second process of annealing in the above mentioned apparatus.

Wishing to remove a prejudice held by many opticians, we will not omit to distinctly state that the pressure exerted on the glass while in a semi-liquid state is by no means the cause of internal strain or pressure ; on the contrary, the only source of these must be looked for in the accelerated process of chilling which has to be made use of in order to prevent deformation.

The favourable practical results obtained by many opticians with glass prepared in this manner encourage us to recommend its application for all such cases where large numbers of lenses of the same kind have to be made with various curvatures and diameters within the limits between 12 to 120 mm. The increased costs of glass prepared in this manner are amply compensated for by the saving of material and work. Lenses having the exact form of the desired lenses suffice as patterns. On account of the prolonged period of annealing, we require, as a rule, a term for delivery from six to eight weeks. We are prepared to submit sample lenses to our customers.

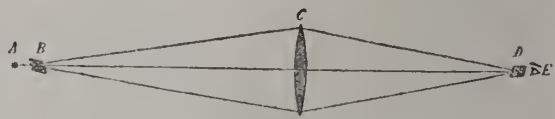



*Fig.* 1.


*Fig.* 2.

$A$ Illuminating source (bright-burning petroleum flame).
$B$ Polarising nicol prism.
$C$ Lens or disc to be tested.
$D$ Analysing prism.
$E$ The observer's eye.
$S$ Concave mirror.

In fig. 1 $A$ and $B$ are conjugative points with respect to the lens $C$ ; in fig. 2 both points are situated in the plane of the centre of curvature of the mirror $S$.

---

EIKONOGEN DEVELOPMENT.—According to a recent communication of M. L. Jullien, photographer, of Geneva, the best process for development is the following : Place for a minute the exposed plate in the carbonate of soda bath or the carbonate of potash bath, withdraw it and plunge it in a bath containing the eikonogen and the sulphite. The carbonate of soda enters into the pores of the gelatine, and the quantity contained in them on coming from the first bath is more than sufficient to facilitate the reduction. This method gives good results, it seems—better than any hitherto obtained.—*Revue Suisse de Phot.*

AMERICAN PHOTOGRAPHERS AND TARIFFS.—Photographers have all learned of the new "Tariff Bill," and the majority have become informed by their enterprising stock-dealers of the increase of price of some of the principal staples used in the production of photographs. At first sight—"in these times when the prices for photographs are so ruinously low"—all this appears rather dismaying to the average photographer. It need *not* dismay him, however, unless he wills that it should do so. There is a bright side to it all, and he can gradually and surely work over to it if he wants to. For a long time there has been a continuous howl about "rough competition" and "cut rates." Now, the first step over to the bright side, after you begin to believe there is one, is to ignore the competition and raise the rates. Two good advances are thus made. We do not advocate a large advance in prices. If fifty cents per dozen were added all over the country, it would secure more than double enough to pay the "extra tariff" on albumen paper, nitrate of silver, eikonogen, and so on. Then you could stop "howling," for there would be nothing left to howl about. It is true your patrons would howl a little, but—let 'em. They will soon stop, provided you keep a neat establishment, work alongside of the growth of your art, pay for your *Magazine* promptly for 1891, and make the best of work.—*Wilson's Photographic Magazine.*

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

FRENCH PHOTOGRAPHIC SOCIETY—DEVELOPING PASTILLES—CLOTH BACKGROUND—LENSES BY ZEISS—EXPOSURE SHUTTERS—IRIS DIAPHRAGMS—PRINTS BY THE ARTIGUES PROCESS—LANTERN IMAGES—SYNDICATE OF PHOTOGRAPHY—PROPERTY IN PHOTOGRAPHIC PRODUCTIONS—PHOTOGRAPHIC INSTRUCTION—EXPOSURE METER—CHLORIDE OF SILVER PAPER AND CELLOIDINE—BIBLIOGRAPHY.

*Developing Pastilles.*—M. Pétry, of Bar-sur-Seine (Aube), has sent to the Society some developing pastilles, the composition of which has not been disclosed. This is the fourth or fifth time that a photographic medicament of this kind has been produced. Many persons have remarked that products which are of a dangerous nature ought not to be presented in this form. They resemble bon-bons, which might tempt the appetite of children who stray into the laboratory. Care must, therefore, be taken to keep in safety pastilles which are destined for quite other purposes than that of medicine or of satisfying the palate.

*Cloth Background.*—A manufacturer sends a sample of cloth for photographic backgrounds, shaded from black to white in the fabric itself. It may be good, but I prefer the natural shading produced by a plain ground arranged on a curved frame.

*Lenses by Zeiss.*—M. Fabre has written a paper in favour of the new lenses by Zeiss, made with the Jena glass of a highly refractive kind. The lenses tried by him possess exceptional properties, which, he says, have not been shown by any lenses of other makers. There are notably two wide-angle objectives of great rapidity, the one embracing an angle of 100°, and the other of 110°. The facts stated are extremely curious, and merit attention; but as the conclusions arrived at have alone been given, I defer farther remark until the complete experiments are made known.

*Various Exposure Shutters.*—M. Balagny showed a triplex exposure shutter of American origin, of which he speaks very highly on account of its ingenious mechanism, which allows one to expose at will, by the simple pressure of the rubber ball, without having to reset the spring. We can, at will, give either an instantaneous or a timed exposure. Messrs. Marilier and Robelet also showed a new model shutter of Parisian creation, the working of which appeared to be very smooth. The system is that of Levêque and Harlé. The number of instantaneous shutters is already considerable, but the imaginations of inventors in this direction are far from having come to an end.

*Iris Diaphragm.*—M. Gravier, in the names of Messrs. Clement and Gilmer, showed a circular plate with iris diaphragm ready to be mounted in a photographic tube. It is well combined, and capable of realising any diameter of diaphragm that may be required.

*Prints by the Artigues Process.*—The same member exhibited prints obtained by the carbon process of M. Artigues, which was mentioned in the letter published in the PHOTOGRAPHIC NEWS of 1889, p. 517. This very interesting process has since remained *in statu quo.* It has been in vain to apply to M. Artigues for samples of the paper with which to try it. We ought, however, to be able to derive benefit from a method which gives such remarkable results as those which were placed before the meeting. M. Gravier's only object in bringing up again the work of M. Artigues has been to rouse him, if possible, from torpor. We have already expressed our view of the proceedings necessary for trying M. Artigues' method. A thin film of gelatine is coated upon paper, and, as soon as set, it is sprinkled with black powder. It is allowed to dry, and then bichromated. Development is effected, as M. Artigues informed us, by mixing sawdust with the hot water used for the purpose, and by pouring this mixture on to the sheet placed in a vertical position. The possible applications of this process to photogravure appear to me particularly interesting.

*Lantern Slides.*—M. Balagny has made a journey in Switzerland, during which he has executed a number of pellicular negatives of large size, reductions from which, admirably prepared, were shown in the lantern. The charming journey from Lucerne to the Engadine was made without any fatigue: nothing but the gratification of the eyes. This fine series of lantern projections is certainly one of the most remarkable that has ever been shown to the Society.

*General Syndicate of Photography.*—The question of property in photographic productions crops up afresh. The projected law only endows owners with a proprietary right for twenty-five years—a considerable difference from that of fifty years after the death of the author accorded to drawings, engravings, and lithographs. This inequality may cause much confusion and great injury; the general syndicate, therefore, is endeavouring to obtain a legal assimilation of photography to the other graphic arts. Active steps in this direction have been taken by means of representations to the deputies.

*Photographic Instruction.*—There being, in France, an almost complete absence of photographic instruction, the syndicate is occupied with the subject, and watches closely the efforts made in England towards the creation of a photographic institute. It is seeking a way to stimulate a movement of a similar character in Paris, but that will be a difficult matter.

*Watkins' Exposure Meter.*—The president presented to the syndicate the exposure meter of Watkins. It was described, and the advantages offered by this ingenious instrument were explained. It constitutes a sure guide as to the length of exposure in difficult cases, where the appreciation by the eye puts the most experienced judgment at fault. This photometer, so complete in its form and in its combinations, was examined with interest.

*Chloride of Silver Paper and Celloidine.*—Another interesting presentation was that of paper and celloidine by M. Engel Feitknecht, of Douanne, Switzerland. The paper, prepared with collodio-chloride of silver, is rapid, and gives fine impressions. Toning and fixing are carried on simultaneously in a bath the formula for which is given by the maker. Eight to ten minutes suffice for the operation. Prints thus obtained should have greater permanency than those on albumenised paper.

*Bibliography.*—Amongst the recent photographic publications, we may mention "Photographic Recreations," by Messrs. Bergeret and Drouin. This work is an interesting collection of a host of *tours de main*, revealing the manner of achieving certain results, of which examples have been seen or heard, without its being known how they were accomplished. Thanks to "Photographic Recreations," we may amuse ourselves considerably, and get out of the monotony which is offered by work alone. There is a host of descriptions for the production of an infinity of pleasant surprises.

## Notes.

*Nature*, a journal which has considerable influence in the world of science, is now rendering good service to the general public by calling attention to the filthy air of London, the dirt in which consists chiefly of unburnt and wasted fuel. One correspondent suggests that the different scientific societies of London should take up the subject, and bring their influence to bear either upon the Government or the County Council, in the endeavour to get them to take steps to abolish the nuisance. Photographers are more affected than others by the dirt in the air, because of the large amount of daylight it cuts off. The inert masses of the public are slow to move in the abolition of old-established nuisances, which, by force of long familiarity, almost come to be looked upon as valuable property, so initiatory steps in the direction of improvement are more likely to come from above than from below. Probably commercial profit could be made by a public company which would supply and fix rational household grates in place of the ignorantly devised grates put into houses by jerry-builders, and would arrange with the householder that they shall be paid for gradually out of the money they will save in the consumption of coal. At present about three-quarters of the heat produced in common household grates escapes up the chimney, and it is probably safe to assume that in London more than twice as much coal is burnt for house-warming purposes than would be necessary with an intelligent system of consumption.

This month the Swiss *Revue de Photographie* has entered upon the third year of its existence; it is an excellent periodical. The January number contains some good illustrations, one of them a photo-mechanical print by Messrs. Thevoz & Co., of Geneva, a comparatively young firm, but one which has made rapid progress in the quality of its productions. A chromophototype by Mr. J. Brunner, of Winterthur, is pretty, representing a little girl playing with a bird; some grass in the picture is of rather too gaudy a green to appear quite natural. From the *Revue* we learn that the Geneva Photographic Society has seventy-eight members, and that, during the past year, a rule was altered in order to admit ladies. The same journal quotes some particulars about the diazotype processes from our pages; it also suggests that a general meeting of Swiss photographers shall take place in Lausanne in March or April next.

Photographic exhibitions are multiplying abroad as well as at home. One under the auspices of the Photographic Society of Nantes will open at the Préaubert Gallery, rue Le Kain, in that city, on the 25th of this month, and will close on the 25th February; it will be devoted chiefly, if not entirely, to the artistic side of photography. A French exhibition will open in Moscow on the 15th of October next, and in it Class VI. will be devoted to photography. An International Exhibition will be open in Bordeaux from May 1st next to November 5th. The first group, Class III., includes photographs and photographic apparatus.

Those aggressively healthy persons who despise great coats, who break the ice before entering their morning bath, and who for years have been complaining that we never have an "old-fashioned Christmas now," have had, this year, we think, enough and to spare of discomforting weather. For many weeks Jack Frost has now had undisputed sway, and, in London at least, has been helped to make things generally disagreeable by the smoke-fog fiend. Photographers especially have suffered in their business from this dreadful partnership, and complaints are heard from all sides of the utter impossibility of doing any kind of work. One large firm of carbon printers, who depend upon solar light, tell us that for fifteen days their hands were idle. Others are stopped for want of clients, for even the electric light will not charm sitters out of doors in this dreadful weather. Burst water-pipes represent another minor inconvenience that affects photographers more than other folk, and make them fancy that January is certainly not "the happiest month of all the glad new year."

While most persons have been abusing the snow, and the vestries for not carting it away from our thoroughfares, one lady of scientific proclivities writes to the *Times*, and calls attention to its beauty. She sings of snow falling "in stellar forms of infinite and indescribable beauty," and quotes Tyndall as follows: "In the polar regions these exquisite forms were observed by Dr. Scoresby, who gave numerous drawings of them. I have observed them in mid-winter filling the air, and loading the slopes of the Alps; but in England they are also to be seen, and no words of mine could convey so vivid an impression of their beauty as the annexed drawings of a few of them executed at Greenwich by Mr. Glaisher."

This mention of a well-known phenomenon will doubtless excite the energy of some enthusiastic photographer, who will endeavour to fix with his camera these beauteous forms. We must own that we have tried to do so, but have failed. We employed a half-inch microscopic objective attached to the camera front, and a bed of black velvet to catch the falling snow flakes. It is true that we caught several, but they all seemed determined to stick up edgeways, and it was impossible to get any one of them to lie flat enough for our purpose. They also insisted upon partially melting before we had done with them. We shall be glad to hear from any of our readers who have had better success than we have. So far as we are aware, the beautiful six-rayed stars of which snowflakes are made up have never yet been successfully photographed.

The French paper *l'Illustration* publishes some pictures descriptive of a scheme which has been revived for journeying towards the North Pole by means of a balloon. Of these pictures, one shows the balloon serenely sailing away over the ice hummocks with a heavy trailing rope to keep it at a fixed altitude, while another depicts the interior of the car. This is a kind of Noah's ark, for two compartments contain sundry animals, another forms the living room of the aëronauts, while the the third is a photographic dark room, with a hole in the floor, down which points a camera. There certainly would not be much to photograph with this vertical position of the camera, for one hummock is much like another, and there is not much variety in the character of ice floes. But everything looks very nice and snug in the pictures, and a journey to the North Pole, on paper, in this form, is evidently a thing to hanker after. The enterprise is, however, fraught with a few difficulties. The polar regions are, travellers tell us, almost without wind, and thus the motive power upon which the travellers depend would be absent. Ballooning schemes have always had a fascination for the French, possibly because the balloon is of French origin. A word is wanted to describe those enthusiasts who believe in the possibility of controlling them. How would *balloonatics* do?

---

It is a pity that journalists, when writing on photography, do not take the trouble to make inquiries before putting their opinions on paper. For want of this precaution, we get such a statement as the following:—"The preposterous charges which photographers have been wont to make for reproductions of still-life objects—including such articles as statuary, medals, book-plates, &c.—seem likely to be on the verge of breaking down. There is now such an army of amateur workers who know what the actual cost out of pocket of photography is, that everybody's eyes have been opened to the excessiveness of the charges." The reason why the writer has arrived at the above conclusion, is simply because the University Press at Oxford announces that it is prepared to hand over one hundred collotypes—prints from a whole-plate negative—for 12s., the original cost of the negative being 3s. What connection there is between a trading concern which goes in for photography on a large scale, and a private photographer who is engaged to photograph "still-life objects," it is difficult to see. The two transactions are conducted on a totally different basis.

---

It is surely no novelty to be told that collotype prints can be produced at a cheap rate. This is a matter of common knowledge and common experience. As for the amateurs opening the eyes of everybody to the excessiveness of the charges of professional photographers, this is a question which, in order to deal with adequately, demands more space than can be afforded here. The proposition that a dry plate costs so much, developers so much, fixing solution so much, that, therefore, the photograph should be such-and-such a sum, is equivalent to saying of one of Sir John Millais' pictures, that the paint-brushes cost this sum, the paints that sum, the canvas so many shillings, the frame possibly so many pounds, and that, consequently, Sir John Millais should be contented with a modest profit—say a certain amount for his time, and, possibly, 15 per cent. on his outlay for materials. The question of brains appears to have been left out of consideration altogether.

---

The writer winds up with this conclusion:—"At present hundreds of collectors, with thousands of objects, only await the time when photographers will condescend to recognize the fact that inanimate and animate objects do not present the same difficulties, and so should not be charged upon the same scale, to put an enormous amount of business into their hands." In answer to this, one has only to reply that if there is a sufficient amount of work to keep a photographer fully employed, there is not the slightest difficulty in obtaining scores of capable men who will do the work at a price which will enable the public to obtain reproductions of works of art at a moderate rate. But, as everybody who is at all acquainted with the subject knows, the photographer is not the man who is responsible for these vast undertakings. He is simply the man who does the work; somebody else engineers the business, and somebody else performs the office of middleman in supplying the public with the prints. It is not the photographer who gets the lion's share of the profit. In many cases, considering the uncertainties which the most experienced photographer cannot guard against, the result to the responsible man has been a loss rather than a gain.

---

Mr. Henry N. Stevens, the son of the famous book-collector, Mr. Henry Stevens, of Vermont, points out an interesting use of photography. He says that his father was in the habit of photographing the titles of rare books, and by this means he frequently became aware of the existence of unknown editions. It is a matter of common knowledge that the slightest variation in the printing of an early edition of rarities gives the particular volume an enhanced value in the eyes of bibliophiles. Mr. Stevens used to find that, by photographing one particular edition (for he not only photographed titles, but sometimes whole pages of the book, and even the book itself), that he was able to detect minute differences in the type, and to unearth all manner of curiosities dear to the heart of the book-collector. Mr. H. N. Stevens says that one of his own finds, on which he sets great store, was due entirely to his possessing a photograph of a rarity, which, on comparing with the copy of a book offered for sale at an auction, disclosed to him the fact that the latter was of an unknown edition, and he was, therefore, enabled to carry it off unsuspected under the eyes and noses of a *cognoscenti*, to his own considerable profit. From this it would be seen that troublesome and costly though the process of photographing a volume may be, still, looking at it practically, and in a pecuniary light, it pays.

## ERYTHROSIN SILVER.

BY J. GAEDICKE.

THE extended application of erythrosin silver for the production of orthochromatic plates justifies the practical importance of an investigation concerning the conditions under which erythrosin will precipitate nitrate of silver. The investigation of these conditions has shown that it is by no means indifferent whether the nitrate of silver is poured into the erythrosin solution, or the erythrosin solution into the nitrate of silver solution. To determine the conditions under which these two bodies precipitate, two filtered solutions were produced, namely :—

1st. An aqueous tenth-normal nitrate of silver solution, which in 1 c.c. contained 0·017 grm. nitrate of silver.

2nd. An erythrosin solution in 1 part of water and 3 parts alcohol, which in 1 c.c. contained 0·002 grm. erythrosin.

With these solutions the following two tests, A and B, were made :

A.—1 c.c. tenth-normal nitrate of silver solution was diluted a little with alcohol and gradually mixed with the above erythrosin solution until precipitation ceased and the erythrosin was slightly in excess. The limit of reaction was discovered by placing a drop of the liquid upon white blotting-paper. The red precipitate of erythrosin and silver remains as a red circle, surrounded by a moist halo. As long as the erythrosin is not in excess this halo will be colourless, but the least excess will give it a reddish tint. This appearance took place when 10 c.c. erythrosin solution had been added. Therefore 20 parts erythrosin had precipitated 17 parts nitrate of silver. But the precipitate thus formed was found able to precipitate still more nitrate of silver. To determine the limit of this reaction, the precipitate was mixed with a tenth-normal nitrate of silver solution, shaken, left standing for a little while, and then tested. This was continued until a weak excess of nitrate of silver could be proven. The test was made in such a way that a drop of the liquid put upon white blotting-paper, and the halo forming around the red circle were touched with a solution of ammonium chromate. As long as the halo coloured yellow no excess of silver was present, and the first indication of such was when the halo became brownish-red by the reaction. This took place after 1 c.c. nitrate of silver solution had been used. The erythrosin silver had therefore subsequently absorbed just as much silver as it contained already. The precipitate had therefore united 2 by 17 = 34 parts of nitrate of silver and 20 parts of erythrosin.

B.—Reversing the test, other figures were the result. 10 c.c. of erythrosin solution were mixed drop by drop with tenth-normal nitrate of silver solution, and the test made upon blotting paper until the halo was no longer pink, but colourless. The requirement for this was not 1 c.c. nitrate of silver solution as with A, but only 0·5 c.c. Here 20 parts erythrosin have therefore been precipitated completely by only 8·5 parts nitrate of silver. The erythrosin silver has therefore carried along just as much erythrosin as it contained thereof. The colourless liquid on top of the precipitate had a fluorescing green colour. The red precipitate absorbed still nitrate of silver, but much slower.

To produce the brown halo of chromate of silver, 1 c.c. nitrate of silver solution was required. In this arrangement of the test 20 parts erythrosin had therefore bound 25·5 nitrate of silver against 34 parts as with test A.

For the production of the richest erythrosin silver the following prescription results, therefore, from above tests. Dissolve 17 parts nitrate of silver, and pour into this liquid a solution of 20 parts erythrosin ; add after this another solution of 17 parts nitrate of silver, and let stand for several hours under frequent stirring; finally add a few drops of erythrosin solution.—*Photographisches Wochenblatt.*

## THE YELLOW SCREEN IN ORTHOCHROMATIC WORK.

BY LEON VIDAL.

MANY times and oft we have read or heard said that the use of a yellow screen greatly prolongs the time of exposure, and that it is necessary this screen should be but slightly coloured in order to render its use possible. We are desirous of assailing this error, which is caused by using ordinary plates. It is evident that, in this case, the exposure is greatly increased, and it is necessary, if recourse is had to a yellow screen, to diminish the activity of the blue and violet rays, to give a longer exposure. But this is not the case with orthoscopic plates sensitive to the yellow rays, such as eosine or erythrosine plates. These films, possessing great sensitiveness to the yellow rays, lose but little of their general sensitiveness on account of the interposition of a yellow screen between the subject to be reproduced and the plate. It is not necessary, therefore, to expose more than from two to four or six times, according as the coloured screen is more or less rich in colour. Now, if we consider that the times of exposure are, in normal white light, of a few fractions of a second, or of some seconds at most, we find but little objection to an increase of exposure which will require, instead of a half second, for example, one, four, or twelve seconds.

We have been enabled to make instantaneous prints on orthoscopic plates, correcting the too short exposure by a larger diaphragm, and we are convinced that, owing to the greater sensitiveness of plates treated by colouring substances, it will be possible to operate through coloured mediums just as well as with the ordinary plates. The use of smoked glass has been recommended to moderate the brilliancy of the sky and of the high whites. We see here simply a means of reducing the total activity, but not the partial activity, of any particular part of the view. Against the high whites the remedy is easy ; it will be found in an excess of exposure, and if a yellow screen be used, we will get at the same time a sufficient wiping-out of the blues.—*Le Moniteur de la Photographie.*

THE CHICAGO EXHIBITION, 1893.—A Reuter's telegram announces that President Harrison has issued a proclamation declaring that satisfactory proof has been presented to him that adequate grounds, buildings, and funds have been provided at Chicago for the Columbian Exhibition ; and he therefore declares that it will be opened on May 1st, 1893, and will not close before the last Thursday in the October following. The President, in the name of the Government and people of the United States, invites all the nations of the earth to take part in the commemoration of an event pre-eminent in human history, and of lasting interest to mankind, by appointing representatives at the Exhibition, and by sending such exhibits as may most fitly and fully illustrate their resources and industries, and the progress of civilisation.

## SOME HINTS ON PHOTO-MICROGRAPHY.*

BY T. CHARTERS WHITE.

It is not my intention to inflict on you a long dissertation on the subject of this evening's discussion, but merely to put my remarks in a more coherent form than I should by simply stating them in a conversational way; and in opening these I wish to direct your attention to one point in which I am personally interested, nor do I wish to claim for myself more than my fair share in the revival of the science of photo-micrography. Those who, like myself, are familiar with the progress of microscopical investigations, and have watched and followed their elucidations, have been familiar with the splendid work of Drs. Woodward and Draper in America, and Drs. Beale and Maddox in this country, done in former times. I am speaking now of between thirty and forty years ago, when work was accomplished which, for clearness of definition and amplification, cannot in our days of elaborate apparatus be surpassed, and that in the face of those physical difficulties which optical science has done little to overcome. These difficulties are with us to-day, and in the nature of things must ever continue. I fear it was the appearance of these difficulties which discouraged many in the practice of photo-micrography; nevertheless, others continued in the practice of what must be always a fascinating branch of photography, but whatever was done by different workers in it was not published during the last twenty years—at least, to my knowledge—and it seemed to have reached its ultimatum, and was well nigh dropped out of sight.

All who study histology must have felt, as I did, that the diagramatic engravings illustrating books on minute anatomy and of physiology very inadequately, if not incorrectly, represented the organs and tissues of which they treated, and from this dissatisfaction on my part I resolved to see if a more correct delineation could not be accomplished by photo-micrography. I therefore set to work, and, having only limited means—or if I had had the means, no suitable apparatus was, at that time, forthcoming—I made a very primitive, homely "rig up," for I can designate it by no other name, and succeeded so far that I showed my results to others whom I thought might be interested microscopically, who at first endeavoured to show me that it would never work; others had tried it and given it up as hopeless, but I did not coincide with their views, and, determined not to be deterred in my convictions, I persevered and produced more correct representations of tissues than found in any text books on histology extant at that time. My example and my results stimulated others to try what they could do, and by demonstrations and exhibition of my poor prints at different scientific societies, others were induced to take up the practice, infected by my example, and soon the revival was in full swing, till now the medical journals contain, in almost every issue, photographic representations of pathological specimens. So far, I am greatly satisfied with the progress made since my first paper on this subject appeared in the *British Journal of Photography* in 1883.

Photo-micrographs will henceforth give a more definite view of tissues than was ever the case before; they will, however, never supersede the microscope and microscopical observation, for however highly magnified, however clearly defined they may appear, none of them will stand examination with an ordinary magnifying glass; they can but indicate to the student the general appearances to be looked for, and will be fairly accurate representations drawn by the pencil of light, and free from any bias on the part of the draughtsman. They will also be accomplished in a much shorter time than can be done by the camera-lucida, besides containing also all the elaborations of the most complicated tissue, which fairly defies the capabilities of the most painstaking and careful draughtsman. To produce these results certain conditions must be observed, which experience on my part, as well as on that of others, has fully confirmed. Perhaps the most important is that the photo-micrographic apparatus must be absolutely steady, and free from the very slightest vibration.

There are very few houses in London or any other great town which are sufficiently stable not to be influenced by persons moving about in them, or that are not slightly shaken by tremors arising from the passing traffic, and therefore this tendency to vibration must be neutralised by selecting an operating room in the basement, on as solid a foundation as it is possible to procure. Next, the apparatus itself must be strongly constructed, that no unsteadiness exists in its constituent parts. It must be fixed on a firm base-board, so that whatever slight vibration may arise will be communicated uniformly throughout the whole system of light, microscope, and plate. The base-board must also be placed on some elastic support. Various devices have been adopted to accomplish this by different workers with whom I am familiar. One hangs his apparatus on strong india-rubber rings, suspended from strong iron supports let into the wall of his operating room. Another places blocks of india-rubber as feet under his base-board; others have put bags of cotton-wool under. I find that a bundle of journals placed under each end of the base-board, while firmly and steadily supporting it, serves to break any vibration that may arise, and, notwithstanding many sources of local disturbances, my results show very little, if any, evidence of vibration.

Having overcome this difficulty, the next disturbance may arise from another source. Light your lamp, and accurately focus your object, and let things remain for ten minutes; then look at your object. It will now appear blurred, and considerably out of focus. This arises from the expansion of all the metal parts of the apparatus from the heat of the lamp. Now focus your object again, and in another ten minutes examine it, when probably it may remain as sharp as when you first arranged it, and no further expansion will take place the rest of the evening.

The next precaution to be observed is that the light is accurately centred. This is most important, as upon this depends that freedom from diffraction without which it is hopeless to look for sharp definition. The plan to be adopted is simply to put on the microscope a low power objective—say a 1-inch or $1\frac{1}{4}$-inch focus—and if a diaphragm with a very small stop is attached to the condenser in the sub-stage, rack the microscope out till the image of the stop occupies the centre of the focussing screen. This may be done by altering the relative position of the lamp to the condenser, but is more perfectly done if the condenser has adjusting screws attached to it. I find that having done this with a low power, if that is superseded by one of a higher grade, such as a $\frac{1}{3}$ or $\frac{1}{5}$, the first centreing is only approximate, and a further adjustment is required, but this is more easily done, having had the previous rough adjustment. Too much attention cannot be

* Read at the Photographic Club, January 7th, 1891.

paid to this point, especially with the use of the higher powers, as any errors in illumination existing with the lower power would be exceedingly exaggerated when employing anything higher than a $\frac{1}{3}$ of an inch focus. In photographing with the lower power objectives, *i.e.*, from $1\frac{1}{2}$-inch down to 4-inch focus, a great evenness of illumination will be derived from the use of a ground-glass screen interposed between the lamp and the sub-stage condenser, the ground surface of the glass being placed next to subject to be photographed. This glass acts as a radiant, and serves to diffuse a soft, even light all over the field of view, without perceptibly increasing the length of the exposure. It is well to mention this, as many who may feel inclined to take up photo-micrography would do well to begin with low powers before proceeding to high power work.

Having attended to these three primary considerations, there remains one other which can only be overcome in two ways. I allude to the difference between the visual and actinic foci of the lenses. This difference exists to a greater extent in the lower powers, but also is found in those above $\frac{1}{6}$, but not in so marked a degree. I seldom use any objective lower than a $\frac{1}{3}$, but with this and upward I always find it advisable to withdraw the objective to a slight, *but very slight*, appearance of fuzziness after I have obtained the maximum of sharpness. Even then I cannot be always sure of my success; but, in the majority of cases, this will be found sufficient. The makers of some objectives for this work have corrected them for the actinic foci; this is especially remarkable in the apochromatic lenses constructed at the present day, and which, but for their high price, would be most invaluable to many in the practice of this art; and it makes one regret that the necessity for economy prevents the acquisition of such important appliances. Having, therefore, a steady apparatus free from vibration, a due regard for the expansion of the microscope by heat, a correctly centred beam of illumination, and a corrected objective, the practice of photo-micrography may be said to be reduced to the easiest conditions.

A few words might be said upon such subsidiary subjects as the proper preparation of the subjects to be submitted to this process, such as the flatness of the object and its proper staining; but as some specimens are to be passed through the lantern by way of illustration, the consideration of these subjects might be reserved for some future occasion. I will explain the slides as they are passed through, only asking you not to be hypercritical in your judgment, for I can truly say with Martial, "You cannot say harder things of my trifles than I have said myself of them."

A NEW APPLICATION OF THE MAGIC LANTERN.—A correspondent of the *Optical Lantern Journal* says:—"We are in the habit of utilizing the lime-light lantern in connection with advertising our numerous classes and entertainments, and hitherto written or printed slides have been used; the thought occurred to me that if I could write on a transparent gelatine paper by the typewriter it would look much neater and bolder on the sheet, which is fixed on the opposite side of the roadway to the lantern. The experiment was tried. I found the gelatine would not hold sufficient of the ordinary ribbon-ink, so that it was necessary to dust it over with powdered chalk before writing; the gelatine sheet was then mounted between glass in the ordinary manner, and the result was extremely satisfactory in every respect. The display required a little ingenuity to get it in the limited space, but it was, as expected, much bolder and clearer than the old method."

## ASTRONOMICAL TELESCOPES.*

BY A. A. COMMON, F.R.S., TREASURER TO THE ROYAL ASTRONOMICAL SOCIETY.

DURING the present century the aperture of the refracting telescope has increased enormously; the manufacture of the glass discs has been brought to a high state of perfection, particularly in France, where more attention is given to this manufacture than in any other country. Early in the century the great difficulty was in making the disc of flint glass. M. Guinand, a Swiss, beginning in 1784, succeeded in 1805 in getting discs of glass larger and finer than had been made before, and refractors grew larger and larger as the glass was made. In 1823 we have the Dorpat glass of 9·6 inches, the first large equatorial mounted with clock-work; in 1837 the 12-inch Munich glass; in 1839 the 15-inch at Harvard, and in 1847 another at Pulkowa; in 1863 Cooke finished the 25-inch refractor which Mr. Newall gave, shortly before his death last year, to the Cambridge University.

This telescope the University has accepted, and it is about to be removed to the Observatory at Cambridge, where it will be in charge of the Director, Dr. Adams. In accordance with the expressed wish of the late Mr. Newall, it will be devoted to a study of stellar and astronomical physics. There is every prospect that this will be properly done, as Mr. Frank Newall, one of the sons of the late Mr. Newall, has offered his personal services for five years in carrying on this work. Succeeding this we have the 26-inch telescope at Washington, the 26-inch at the University of Virginia, the 30-inch at Pulkowa, and the 36-inch lately erected at Mount Hamilton, California—all these latter by Alvan Clark and his sons. By Sir Howard Grubb we have many telescopes, including the 28-inch at Vienna. Most of these telescopes have been produced during the last twenty years, as well as quite a host of others of smaller sizes, including nearly a score of telescopes of about 13 inches diameter by various makers, to be employed in the construction of the photographic chart of the heavens, which it has been decided to do by international co-operation.

The first of these photographic instruments was made by the Brothers Henry, of the Paris Observatory, who have also made many very fine object glasses and specula, and, more important than all, have shown that plane mirrors of perfect flatness can be made of almost any size; the success of M. Lœwy's new telescope, the equatorial *coudé*, is entirely due to the marvellous perfection of the plane mirrors made by them. The reflecting telescope has quite kept pace with its elder brother.

Lassell, in 1820, began the grinding of mirrors; he, like Sir William Herschel, working through various sizes, finally completing one of 4 feet aperture, which was mounted equatorially. Lord Rosse also took up this work in 1840; he made two 3-foot specula, and in 1845 finished what yet remains the largest telescope, one of 6 feet aperture. All these were of speculum metal, and all on the Newtonian form. In 1870 Grubb completed for the Melbourne Observatory a telescope of 4 feet aperture, on the Cassegrain plan, the only large example. The mirror of this is of speculum metal. In 1856 it was proposed by Steinheil, and in 1857 by Foucault, to use glass as the material for the concave mirror, covering the surface with a fine deposit of metallic silver in the manner that had then just been perfected. In 1858 Draper, in America,

* Continued from page 13.

completed one on this plan of 15 inches aperture, soon after making another of 28 inches. In France several large ones have been made, including one of 4 feet at the Paris Observatory. In England this form of telescope is largely used, and mirrors up to 5 feet in diameter have been made and mounted equatorially.

Optically the astronomical telescope, particularly the refractor, has arrived at a splendid state of excellence; the purity of the glass discs and the perfection of the surfaces is proved at once by the performances of the various large telescopes. No limit has yet been set to the increase of size by the impossibility of getting discs of glass or working them, nor is it probable that the limit will be set by either of these considerations. We must rather look for our limiting conditions to the immense cost of mounting large glasses, and the absorption of light by the glass of which the lenses are made, coming injuriously into play to reduce the light-gathering power, though it will be probably a long time before this latter evil will be much felt.

With the reflecting telescope the greater attention given to the working and testing of the optical surface has enabled the concave mirror to be made with a certainty that the earlier workers never dreamed of. The examination of the surface can be made optically at the centre of curvature of the mirror in the manner that was used by Hadley in the beginning of the last century, and revived some years ago by Foucault, who brought this method of testing specula to a high degree of perfection; in fact, with the addition of certain methods of measuring the longitudinal aberrations, we have now a means of readily testing mirrors with a degree of accuracy that far exceeds the skill of the worker. It enables every change that is made in the surface during the progress of the figuring, as the parabolisation of the surface is called, to be watched and recorded, and the exact departure of any part from the theoretical form measured and corrected. Mirrors can be made of very much greater ratio of aperture to focal length; I have one here where the focal length is only 2¼ times the aperture; such a mirror in the days of speculum metal mirrors with the methods then in use, would have necessarily had a focal length of about 20 feet. The difference in curvature between the centre and edge of this mirror is so great that it can be easily measured by an ordinary spherometer, amounting, as it does, with one of six inches diameter, to $\frac{3}{10000}$ of an inch, an amount sufficient to make the focus of the outer portion about one inch longer than the inner when it is tested at the centre of curvature. The diagram on the wall, copied roughly from one of the records I keep of the progress of the work on a mirror during the figuring, shows how this system of measurements enables one to follow closely the whole operation.

The use of silver on glass as the reflecting surface is as important an improvement in the astronomical telescope as the invention of the achromatic telescope. It gives a permanency to a good figure once obtained that did not exist with the mirrors of speculum metal. To restore the surface of silver to the glass speculum is only a small matter now. How readily this is done may be seen by the practical illustration of the method I will give. I have here two liquids—one a solution of the oxide of silver, and another a reducing agent, the chief material in solution being sugar. I pour the two together in this vessel, the surface of which has been cleaned and kept wet by distilled water, which I shall partly empty, leaving the rest to mix with the two solutions; you will see in the course of about five minutes the silver begin to form, eventually covering the whole surface with a brilliant coating that can be polished on the outer surface as bright as that you will see through the glass.

Reflecting telescopes have advantages over the refracting telescopes in many ways, but in some respects they are not so good. They give images that are absolutely achromatic, while the other form always has some uncorrected colour. They can be made shorter, and, as the light-grasping power is not reduced by the absorption of the glass of which the lenses are made, it is in direct proportion to the surface or area of the mirror. They have not had in many cases the same care bestowed upon either their manufacture or upon their mounting as has been given in nearly every case to the refracting telescope. Speaking generally, the mounting of the reflecting telescope has nearly always been of a very imperfect kind—a matter of great consequence, for upon the mounting of the astronomical telescope so much depends. To direct the tube to any object is not difficult, but to keep it steadily moving, so that the object remains on the field of view, requires that the tube should be carried by an equatorial mounting of an efficient character. The first essential of such a mounting is an axis parallel to the axis of rotation of the earth. The tube, being supported on this, will follow any celestial object, such as a star, by simply turning the polar axis in a contrary motion to that of the earth, and at the same rate as the earth rotates on its axis. If we make the telescope to swing in a plane parallel to the polar axis, we can then direct the telescope to any part of the sky, and we have the complete equatorial movement. There are several ways in which this is practically done; we can have a long open-work polar axis supported at top and bottom, and swing the telescope in this, or we can have short, strong axes. As examples of the first, I will show you pictures of the mountings designed for Cambridge and Greenwich Observatories some forty years ago by Sir G. Airey, lately and for so long our eminent Astronomer-Royal; and as examples of the other form, amongst others, the large telescope lately erected at Nice, and also the larger one at Mount Hamilton, California, now under the direction of Prof. Holden.

The plan of bringing all the various handles and wheels that control the movement of the telescope and the various accessories down to the eye end, so as to be within reach of the observer, is carried to the highest possible degree of perfection here, as we can see by an inspection of the picture of the eye end of this telescope. The observer with the reflecting telescope is, with moderate-size instruments, never very far from the floor, but in the case of the Lick telescope he might have to ascend some thirty feet for objects low down in the sky. Thanks to the ingenuity of Sir Howard Grubb, to whom the idea is due, the whole of the floor of the Observatory is made to rise and fall by hydraulic machinery at the will of the observer—a charming but expensive way of solving the difficulty, as far as safety goes, but not meeting the constant need of a change in position as the telescope swings round in keeping up with the motion of the object to which it is directed. The great length of the tube of large refractors is well seen in this picture of the Lick telescope; it suggests flexure as the change is made in the direction in which it points, and the consequent change of stress in the different parts of the tube.

*(To be continued.)*

# Patent Intelligence.

### Applications for Letters Patent.

283. W. FIDDES, 1, Berkeley Crescent, Clifton, Bristol, "Photometrical Apparatus."—January 6th.

352. J. B. KING and J. BICKLE, Great Western Docks, Plymouth, "Cameras."—January 8th.

402. J. E. THORNTON, 3, New Lorne Street, Manchester, "Changing Photographic Plates."—January 9th.

443. R. FOWLER, 6, Lord Street, Liverpool, "Improvements in Cameras Carrying their own Plates."—January 9th.

### Specifications Published.

3,979. *March 13th*, 1890.—"Picture-frame Fasteners." MARIE ROSALIE KROOK, 1, Rosary Gardens, South Kensington, Married Woman.

My invention is designed to supply a long felt want of keeping pictures, especially small ones, in their exact position when hanging on walls, and preventing them from being pushed away when being dusted or from moving when doors are closed.

For this purpose I use a special pin, which will somewhat vary according to the size and material of the picture frame for which it is intended.

For ordinary small wooden frames, I use a pin somewhat like two drawing pins joined together, having either a round or square collar and a sharp-pointed steel pin at either end, one end of which, of a length sufficient to hold firmly, is driven into the back of the picture frame, while the other is driven into the wall, and, having a fine point, and being small in size, it makes a scarcely perceptible hole in the wall, and does no damage, yet holds the picture securely in its position.

For larger pictures, I make the collar with a hole for a small screw or nails to fasten it to the picture frame, or the end which is inserted in the frame may be made as a screw.

For plush, composition, or other small frames, where a needlepoint or screw cannot be inserted, I make the collar of wood, which may be glued or attached by cement to the picture frame.

The collar may also be made thicker at the top than at the bottom, and bevelled, or triangular in shape, so as to hold securely in their position pictures which may be hung sloping forward, and which, therefore, only touch the wall at the edge of the bottom of the frame.

6,918. *May 5th*, 1890.—"Strips or Bars for Glazing." GEORGE DEACON, 103, Lower Thrift Street, Northampton, Horticultural Builder.

My invention relates to improvements in strips or bars for glazing, applicable to rafters, frames, sashes, and the like, and consists of a core or strip of wood (or metal) covered with sheet lead on the top and the two sides, and partly on each side at the bottom, and bent outwards to form the lapping strips to cover or secure the edges of the glass. These said strips or bars are intended to be screwed or nailed on to the top of rafters or the like. The aforesaid strips or bars are about one-third the size of the rafter it is intended to be fixed to, in order that the glass shall have a bearing on the rafter similar to the ordinary rebate, and the lead strips pressed down to secure the glass.

The bars or rafters to which the strips are attached may be of any suitable section and of any material.

The strips are fastened with nails or screws, but preferably with copper or brass screws to prevent rust.

The object of my invention is, that by taking out the screws the strips may be removed from the rafters, to permit the glass to be taken off the rafters without damage; temporary buildings can be erected and removed by this system more readily than by the ordinary glazing process now in common use.

### Patents Granted in America.

441,831. (United States Patent Office.) "Photographic Film." GEORGE EASTMAN, Rochester, N.Y. Filed November 6th, 1890. Serial No. 370,435. (No model.)

*Claim.*—1. As a new article of manufacture, a flexible film-support containing when dried a volatile substance, combined with a sealing-coating on each of its sides.

2. As a new article of manufacture, a photographic film consisting of a flexible film-support containing a volatile substance, combined with a sealing-coating on one side, and with a sealing-coating which is photographically sensitive on the other side.

3. As a new article of manufacture, a photographic film consisting of a flexible film-support containing a volatile substance, combined with a sealing-coating on one side, and with a sealing-coating of sensitive gelatino-argentic emulsion on the other side.

4. As a new article of manufacture, a photographic film consisting of a flexible film-support containing a volatile substance, combined with a sealing-coating of insoluble gelatine on one side, and with a sealing-coating of sensitive gelatino-argentic emulsion on the other side.

5. As a new article of manufacture, a photographic film consisting of a flexible film-support containing a volatile substance, combined with a sealing-coating on each side, one of said coatings carrying photographically-sensitive material.

6. As a new article of manufacture, a flexible film-support composed of a nitro-cellulose compound containing a volatile substance, as camphor, combined with a sealing-coating on each of its sides.

7. As a new article of manufacture, a photographic film consisting of a flexible film-support composed of a nitro-cellulose compound containing a volatile substance, as camphor, combined with a sealing-coating on one side, and with a sealing-coating which is photographically sensitive on the other side.

8. As a new article of manufacture, a photographic film consisting of a flexible film-support composed of a nitro-cellulose compound containing a volatile substance, as camphor, with a sealing-coating on one side, and with a sealing-coating of sensitive gelatino-argentic emulsion on the other side.

9. As a new article of manufacture, a photographic film consisting of a flexible film support composed of a nitro-cellulose compound containing a volatile substance, as camphor, combined with a sealing-coating of insoluble gelatine on one side, and with a sealing coating of sensitive gelatino-argentic emulsion on the other side.

10. As a new article of manufacture, a photographic film consisting of a flexible film-support composed of a nitro-cellulose compound containing a volatile substance, as camphor, combined with a sealing-coating on each side, one of which carries photographically-sensitive material.

---

M. LEON VIDAL has been appointed a professor in the National School of Decorative Arts at Paris.

ENFIELD CAMERA CLUB.—The first annual exhibition will be held in the Lecture Hall, Chase Side, Enfield, on Saturday, January 31st, from 3 to 6 p.m., and from 7.30 to 10 p.m. The exhibition will be opened by Captain H. F. Bowles, M.P. There will be on each occasion an optical lantern entertainment, and a selection of vocal and instrumental music.

NEXT Thursday night, at eight o'clock, Dr. J. Reynolds will give a lecture, with lantern illustrations, at the Gresham Hall, Gresham Road, Brixton, under the auspices of the Brixton and Clapham Camera Club. His subject will be "Iceland." He apparently does not wish to be thought one of those peculiar people who rejoice in regions of ice and snow, for it is announced that the lecture will be descriptive of "scenes in the volcanic and hot-spring regions of the south-west."

A DYNAMITE BLAST PHOTOGRAPHED.—A daring feat in photography was performed last week by Dr. George H. Bailey, of Boston. He succeeded in getting a fine negative of a blast of a ledge near Savin Hill, one of the largest on record, in which two hundred and fifty pounds of dynamite were used. He did it at the risk of being crushed by some huge rock, and moved himself and camera out of the way just as a boulder several tons in weight was about to land dangerously near him. The picture was taken just as the dust and stones had reached their highest elevation, and is as interesting as it is rare.—*Photographic Times.*

# Correspondence.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Sir,—Will you kindly allow me to inform our numerous members and friends, through the medium of your journal, that we have just been presented with a handsome book-case by one of our members (Mr. E. W. Parfitt). We now desire to fill it with photographic literature as speedily as possible, and I am requested by the council to state that all gifts of books, &c., for that purpose will be most cordially acknowledged if addressed to us at the Champion Hotel, 15, Aldersgate Street.

R. P. Drage, *Hon. Sec.*

*The "Champion" Hotel, Aldersgate Street, January 12th.*

## ZOOLOGICAL PHOTOGRAPHS.

Sir,—In the first page and a-half of Mr. Frank Haes' article in the Photographic News of February 16th, 1866, eight animals are mentioned of which that gentleman attempted to take the portraits—to wit, a horse, a chimpanzee, a monkey, a lemur, an aye-aye, a bat, a clouded tiger, and a binturong.

In the case of the horse Motley, the "result was an absolute failure." With the monkey, "I never was more baffled in my life; in fact, I had to give it up." Of the aye-aye, "I only obtained one negative; all the others were useless." The bat "I was obliged to relinquish, as the animal was constantly clambering over the wires." "Of the clouded tiger, "the photograph is much spoilt." Of the binturong, "the photograph is a failure." In the commencement of his article Mr. Frank Haes speaks of a record of his "mishaps and misadventures." It is useless to continue. We have quoted Mr. Frank Haes' own words, and wonder—though a failing memory may account for it—that he is now "rather surprised to learn that his list of animals contained so many, generally more unsuccessful."

In the matter of the clouded tiger, our apology is ignorance. Though aware that this animal is occasionally tamed in the East, we knew not—Mr. Frank Haes himself has omitted to mention it—that there was a tame and pet tiger in the Zoological Gardens in the summer of 1865. This fact certainly renders our compliment to Mr. Frank Haes on his discretion—which is the better part of valour—unnecessary. In his own language, the "insinuation is uncalled for."

The Writer of the Article in the "Year-Book."

# Proceedings of Societies.

## The Photographic Society of Great Britain.

At the first ordinary meeting of this Society held in its new rooms, 50, Great Russell Street, on the 13th inst., the chair was occupied by Captain W. de W. Abney, C.B., F.R.A.S., vice-president.

Auditors of the Society's accounts were nominated, and Messrs. G. Scamell and F. Ince accepted the office.

Messrs. F. Ince, Chas. Sawyer, J. Desiré England, E. Clifton, and J. R. Gotz were appointed scrutineers of the balloting papers at the ensuing election of members of council.

A presentation of Dr. Emerson's "Wild Life on a Tidal Water" was received, and a vote of thanks recorded.

Mr. E. W. Maunder, F.R.A.S., of the Greenwich Observatory, then commenced the display ot a large number of lantern slides illustratiug "Photography Applied to Astronomy," accompanied by copious explanations and remarks. He commenced with a statement that he should not deal with such questions as the composition of developers or sensitive plates, concerning which he should rather come to the Society for instruction than presume to give any. He proposed to give an account of what photography had done for astronomy, and as its first important work in that direction was photography of the sun, he should begin with some illustrations of that kind of work. He showed drawings of the Dallmeyer photoheliograph used at Greenwich, and that of Mr. De la Rue. The first slide shown was that of a sun spot taken on November 18th, 1882. This was by far the largest spot ever photographed at Greenwich; its area extended over 3,500,000,000 square miles. When this spot first appeared, a magnetic disturbance began which became very violent as the spot approached the centre of the suu's disc. Signalling was interrupted at many telegraphic stations, and an aurora was visible at the same time. A photograph exhibitiug very much better definition, taken by Janssen, of Meudon, of a spot in June, 1885, was next put on the screen. An American slide showing the granulations of the surface, and the faculæ near the edge of the sun, followed; several composition photographs of the corona taken in 1878, 1882, and 1886 were showu, and it was explained that any single photograph would not have included detail both in the highest lights and in the weakly illuminated portions. An actual photograph of the corona of January, 1889, was exhibited in proof of this. Up to 1881 there had been no success in photographing comets, but a slide of one taken by Janssen in June 30th of that year was shown. In 1882 a series of photographs of a comet was taken by a photographer at the Cape of Good Hope, with the telescope belouging to the observatory there, slides from which were exhibited. The Brothers Henry, of Paris, were at about that time engaged in astronomical photography, and a series of photographs of double stars taken by them was shown. A photograph from a chart of a portion of the Pleiades which had occupied about three years in making, and contained nearly a thousand stars, was shown in comparison with a slide of the same portion photographed direct by the Brothers Henry with three hours' exposure. The latter was more accurate, and contained many more stars. Photography of nebulæ was next taken up, and a slide shown of a nebula which was discovered by photography. Photographs by Mr. Isaac Roberts, in which various exposures had been given to a nebula, showed the effect of this variation by the great differences in the size and form of the image. Photographs by the Brothers Henry of the planets Jupiter and Saturn, as well as some of the same subjects taken at the Lick Observatory, were followed by a series of photographs of the lunar surface from the latter place. Mr. Roberts' splendid photographs of the Nebula of Orion, and the very instructive series of the same subject by Mr. Common, were then shown. A photograph of the best drawing of the Nebula of Andromeda was placed on the screen, and certain rifts in the nebula were pointed out, the meaning of which was not at all understood until, in the photograph next shown, taken by Mr. Roberts, it was seen that these rifts were part of a spiral formation. Another slide of a portion of Cygnus, by Mr. Roberts, containing 32,000 stars, was next exhibited. Spectroscopic photography was then introduced, and slides showing the apparatus for compariug the spectra of various metals with that of the sun were put on the screen. The apparatus of Professor Vogel, of Potsdam, was described, as well as the observation for showing the advance or retreat of stars. The most beautiful photograph of the spectrum itself had been taken by Higgs, of Liverpool, and slides of portions of it showed lines of extraordinary clearness. Dr. Common's photographs had been taken with a reflecting telescope; latterly with a 5-foot speculum of 27-foot focus.

Mr. W. E. Debenham asked whether accessory exposure had been employed in astronomical photography. Objects of such faint illumination that they could not otherwise be developed with a given exposure might be made to show themselves by this means. The possibility of getting more stars out by subsidiary exposure was shown by one of the comet photographs taken at the Cape. Where there was faint light from the comet over the sky the stars were most numerous.

Mr. Maunder thought that for the most part astronomers had been satisfied to give longer exposures.

Mr. J. Spiller suggested the use of orthochromatic plates in astronomical photography.

It was stated that Mr. Common is now experimenting in this direction, using orthochromatic and ordinary plates on the same subject.

The Chairman thought that unless a yellow screen were used there would be very little difference between them except in the case of photographing nebulæ. As to what Mr. Debenham had said with regard to preliminary exposure, a plate so treated could not properly be compared with another not thus exposed. He was very pleased to notice the excellent work done with Mr. Common's reflecting telescope.

It was announced that the progress medal had been awarded to Colonel J. Waterhouse, B.S.C., and that an exhibition of photographs and apparatus would be opened at St. Petersburgh on March 29th.

Messrs. W. Barry, John Collier, Capt. J. H. Cowan, H. Dixon, Rev. H. B. Hare, G. Strickland, S. C. Weston, W. Window, and Charles Winter were balloted for and elected members.

---

The Photographic Society of Ireland.

A meeting of this Society was held at 15, Dawson Street, Dublin, on the 9th inst., Prof. J. A. Scott, M.B., in the chair. The Boston Camera Club set of lantern slides entitled "In and round Columbus" was exhibited, and was highly appreciated. The lantern was worked by Mr. Jas. Carson and Mr. M. Hedley, while the descriptive matter accompanying the slides was read by Mr. Greenwood Pim.

A vote of thanks was passed to the Boston Camera Club for the loan of the slides.

---

The London and Provincial Photographic Association.

*January 8th.*—Mr. W. E. Debenham in the chair.

The presentation of a handsome book-case was made to the Society by Mr. E. W. Parfitt, for which a warm vote of thanks was accorded by the members.

Mr. A. Cowan, with a view of testing sulphite of soda as a preservative, which had formed the subject of discussion at the previous meeting, mixed a solution of eikonogen containing 5 grains to the ounce; this was put into five open vessels. To No. 1 was added 5 grains of bisulphite to the ounce; an addition was made to No. 2 of 1 grain sulphite; No. 3, 2 grains; No. 4, 4 grains; and No. 5, 8 grains to each ounce. The solutions were allowed to stand all night, with the result that No. 5 only was colourless in the morning.

Mr. F. C. Kellow asked the best way of making transparencies by reduction in the camera by artificial light; he had tried with an oil lamp of about 60-candle power, but was unsuccessful in obtaining an image after several hours' exposure.

Mr. A. Cowan suggested burning a piece of magnesium wire in the focus of a condenser.

Mr. F. A. Bridge said that in making enlargements with artificial light, the colour of the negative was very deceptive in judging exposure. He had enlarged from a ¼-plate to 20 by 25, using a fairly rapid paper, in from fifteen to twenty seconds.

This being the usual monthly lantern night, a large collection of members' slides was projected on the screen, contributed by Messrs. Everitt, Teape, Freshwater, Cooke, and Briginshaw.

A number of slides was then shown, lent by Mr. Sturmey, sent by the "American Lantern Slide Interchange" for the use of English photographic societies. These slides were the work of members of various American photographic societies, and consisted of views of Washington, New York, Virginia, Florida, Philadelphia, Kentucky, Boston, and other American cities. Particularly interesting was a series of views taken of the wreckage at Johnstown. This disaster happened on May 31st, 1889, and was caused by the overflow of an artificial lake, three miles long, and from half to three-quarters of a mile wide, situated two-hundred and fifty feet above the head of the valley. In consequence of heavy rains, the earth at the sides of the lake gave way, and the water poured through the city, carrying everything before it. The slides, as sent from America, were ranged in boxes furnished with india-rubber grooves, as recommended by Mr. Beach. The plan was much admired, but the question was raised whether the sulphur in the grooving would attack the images after the lapse of time.

The North Middlesex Photographic Society.

At the annual general meeting, with Mr. Humphries, F.S.A., in the chair, Mr. G. R. Martin resigned the secretaryship, and Mr. E. S. Paul the treasurership.

Alterations in the rules were made, by which the title was changed from the North Middlesex Photographic Club to the North Middlesex Photographic Society, and the membership of the council was enlarged from eight to twelve. The retiring officers and members of the council received a vote of thanks for their services.

The following officers and members of the council were elected:—*President*—J. Humphries, F.S.A.; *Vice-Presidents*—W. T. Goodhew, H. Walker; *Curator*—F. Piper; *Council*—C. Beadle, H. Beckett, J. Cherry, T. W. Cox, C. Gill, T. C. Lathbridge, W. A. Lowanchy, G. R. Martin, J. C. S. Mummery, F. L. Pither, J. Saville, H. Smith; *Treasurer*—J. W. Marchant; *Hon. Sec.* — J. McIntosh, 14, Lowman Road, Holloway, London.

---

The West London Photographic Society.

The annual exhibition and conversazione of the West London Photographic Society was held at the Broadway, Lecture Hall, Hammersmith, on the 9th and 10th of January. The president, Mr. W. A. Brown, occupied the chair.

The exhibition presented an attractive appearance, the entire wall space available being covered with pictures, and the frames set off by a background of rich, dark blue cloth. Upwards of 200 frames were hung, and there was a marked general improvement over the work shown at the last exhibition. The room was tastefully decorated with various coloured draperies and choice specimens of dried grasses. Light refreshments, provided by the president, were served each evening, and this department was under the management of Miss Annette Brown, Mrs. Blackmore, and Mrs. Hodges. An excellent musical progamme was provided, which contributed in no small degree to the success of the evening.

The President, after formally opening the proceedings, said that upon the occasion of the last exhibition they were favoured with the attendance of the judges, who, in a few kindly remarks by way of criticism, gave the members much useful information. Unfortunately, the judges could not make it convenient to be present that evening; therefore he regretted that the members would not have the opportunity of being benefited by their comments. He congratulated the Society on the number of pictures, and hoped one result of the exhibition would be to induce others to join the Society.

The Hon. Secretary (Mr. J. A. Hodges) then read the judges' report, which is as follows:—"We, the undersigned, having examined the photographs exhibited at the West London Photographic Society, award as follows:—Silver medal — No. 48, 'Crypt, Canterbury Cathedral,' C. Whiting. Bronze medal — No. 5, 'A Nocturne,' L. C. Bennett. Bronze medal — No. 7, 'Where Duty Calls,' G. F. Blackmore. Bronze medal—No. 24, 'Near Rockford, N. Devon,' J. A. Hodges. Bronze medal—No. 31, Dr. F. H. Low. Bronze medal—No. 41, 'The Distant Sea,' Harry Selby. Bronze medal—No. 49, 'A Snow Scene,' C. Winter. Bronze medal — No. 50, 'Drying the Nests, Whitby,' J. Wilson.

"We have also examined the lantern slides sent in for competition by projection on the screen, and award as follows:—First bronze medal—'Hoar-frost Study,' J. E. Kellow. Second bronze medal—'Waiting to Embark,' J. A. Hodges. We have much pleasure in expressing our gratification at the more than usual merit of the exhibits generally; at the same time, we should like to have seen more figure studies, the photographs sent in being to a large extent topographical. Speaking of the exhibits generally, the selection of the point of view in the landscapes is exceedingly good. We further consider that it is gratifying to see that albumenised silver printing is becoming a thing of the past with the West London Photographic Society. (*Signed*) J. Gale, J. B. B. Wellington, Thomas Clark."

Dr. Low, in proposing a vote of thanks to the judges, said that the following of precedents in a young society appeared no doubt a very desirable thing in the minds of those who had asked him to undertake the duty, for it had been his good fortune to have been placed in a similar position last year. That the thanks of the members were due to the judges for performing what was agreed to be a difficult and invidious task no one would doubt, especially when it was remembered that in the report they referred to the unusual merit of the exhibits. Their praise was, however, a little discounted by speaking of the landscapes as being of a "topographical nature." The word no doubt was a good one, and had been much used of late by certain critics, but in this instance, he (Dr. Low) thought it was not quite the word which was intended.

Mr. G. F. BLACKMORE, in seconding the motion, said that the judges must have had a difficult task in deciding upon the prize pictures, the average merits of the exhibits being higher than it had ever been before, and he could not help feeling that it was extremely creditable to the West London Photographic Society to bring such a fine collection of pictures together. The motion was carried unanimously.

Mr. CHAS. WHITING wished to thank the Hon. Secretary and the Exhibition Committee for the excellent way in which they had performed their work. A glance round the walls must convince anyone that the pictures could not well have been hung to better advantage. He confessed that at one time he did not think the room quite suitable for an exhibition, but he was agreeably surprised to see the transformation which had taken place. The motion having been seconded by Mr. Geo. Lamley, was carried. Mr. Chas. Bilton then proposed a vote of thanks to the ladies and gentlemen who had contributed so much to the success of the evening by providing a musical programme, which was carried unanimously.

On Saturday the proceedings were brought to a close by the exhibition in the optical lantern of the competition slides. The two prize slides were first shown, Mr. J. E. Kellow taking first bronze medal with a beautiful rendering of hoar-frost; the second medal was awarded to Mr. J. A. Hodges, hon. secretary, for a pretty figure study, "Waiting to Embark." Among other sets sent in, those of Messrs. Whiting, Scanlan, Rogers, and Wilson were of a high order of merit. A loan collection of prize slides made from Mawson's plates was then exhibited. Some views in Norway by Paul Lange, and other views by prominent slide makers in the Liverpool Society, were then shown, and the entertainment was brought to a close by the exhibition of Mr. Chas. Whiting's fine series of lantern slide views of Canterbury Cathedral and Stratford-on-Avon.

---

THE TUNBRIDGE WELLS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE fourth annual meeting of the above Association was held at the Mechanics' Institute on Wednesday, January the 7th, at eight o'clock; the President, Mr. F. G. SMART, occupied the chair. Messrs. Lauder, Wilson, and Penn were elected members.

The HON. SECRETARY, in presenting his report for the past year, congratulated the members upon the increased average attendance at the meetings. This annual report set forth, amongst other items, that the Association has lost one member and has been recruited with seven, which brings the total up to thirty, with three now to be elected. There have been four excursions, with an average of nine attending; one of these was by special invitation to Broomhill, the seat of Sir David Salomons, Bart., where the members were hospitably received.

Mr. Cornell gave a demonstration with his oxy-hydrogen microscope, which was interesting and much appreciated. The members also invited their friends to view the Boston lantern slides upon several evenings. Apparatus was shown, as also were the results of the excursions.

The exhibition, which took place at the end of November, was the best one which the Association has held, and it was favourably commented on by the judges—Sir David Salomons, Mr. H. P. Robinson, and Mr. Hastings for that purpose. Sir David Salomons opened the exhibition, and kindly gave the opening entertainment with his specially made lantern. Twenty members competed with 326 pictures; three sent in pictures "not for competition," including some paper negatives, by Dr. Prince, taken as long ago as 1851; twenty-seven amateurs sent in 178 for the open classes, and ten professionals entered with 71. Mr. H. P. Robinson kindly sent his pictures, which had been at the Pall Mall Exhibition, as also did Mr. R. W. Robinson. Unfortunately, the weather was so severe that it was impossible for the public to attend, in consequence of the heavy fall of snow, which was the cause of the exhibition not being a financial success. This is much to be regretted, as this year the work is of a much higher standard, and the first year a change was made, which, it was hoped, would clear expenses.

Dr. Abbott will read his paper on "Optics" at the beginning of March, and Dr. Prince will follow in April with one on his "Experiences and Difficulties in Photography Forty Years Ago;" The Hon. Sec. added that he hoped that Mr. Howard would be able to read his paper on the "Chemical Action of Light." Arrangements will also be made for lantern evenings at informal meetings of the members, of which notice will be given.

The Association has been presented during the year with a plate-rocker, copies of "Photographic Notes," photographic journals, slide rule, and exposure books, by Sir David Salomons, Bart.; Dr. Emerson's "East Anglian Life," by the author; "Naturalistic Photography," by Mr. Lewis.

Exhibits were sent by members to the Kidderminster and Crystal Palace Exhibitions, the latter in competition with other societies for a challenge cup.

It was agreed that members of recognised Clubs and Societies shall be at liberty to attend the ordinary meetings as visitors upon giving notice in writing to the Hon. Secretary.

The following officers were re-elected:—*President*—Mr. F. G. Smart; *Vice-Presidents*—Mr. J. G. Calway, Rev. A. T. Scott, Rev. J. E. Rogers, Mr. G. Percival Smith; *Hon. Treasurer*—B. Whitrow; *Hon. Secretary*—Joseph Chamberlain; *Hon. Auditor*—W. E. Brampton; *Committee*—Messrs. J. W. Morgan, A. W. Pierson, G. W. Howard.

The HON. SECRETARY intimated that he had received a ticket from Mr. H. Harvey-George (secretary of the Great Yarmouth and Eastern Counties Photographic Society) constituting him an honorary member of that Society for the year.

The arrangements were discussed for the entertainment to be held on the 27th inst., which will consist of lantern slides, vocal and instrumental music during the interval between the sets, full particulars of which will be announced.

---

THE HACKNEY PHOTOGRAPHIC SOCIETY.

AT the meeting on Thursday last Dr. GERARD SMITH was in the chair.

In the course of some remarks by members on Shew's adapter, Mr. BECKETT said he thought a large stand would be necessary.

Mr. A. MACKIE then gave his demonstration of the collodio-bromide process, prefacing his demonstration with a short history of the process and its discovery; he made the working of it clear to the non-workers. After coating a plate, he proceeded to expose it for about one second by magnesium ribbon, and develop it with a modified alkaline developer, and fix by ordinary fixing bath. He farther illustrated the process by explaining the composition of the emulsion method of preparing it. Lantern slides made by this process, and shown on the screen, before being put through the lantern were warmed to prevent being broken by the heat.

Mr. F. Gregg was nominated as a member.

---

THE ENFIELD CAMERA CLUB.

A MEETING was held on January 7th, with the president, Mr. D. G. PINKNEY, in the chair.

After transaction of the ordinary business, including the proposal of a new member, the PRESIDENT read a paper on "Eikonogen," and afterwards gave a practical demonstration with this developer as compared with hydrokinone. In the course of his remarks, Mr. Pinkney said that he had found with an under-exposed plate eikonogen certainly brought to view some details which hydrokinone was apparently unable to do, and he produced for inspection two Thomas' extra rapid half-plates which had received identical exposures, namely, two-thirds of a second at 2.50 p.m. on the 20th December under a dull sky.

At first sight it would appear that the hydrokinone developed plate was superior, because it has such a vigorous black in the high light, and almost clear glass in the shadows. The eikonogen developed plate, however, was of a grey colour, and while the sky was quite dark enough for printing purposes, there was undoubtedly more detail in the shadows than in the other negative. At the same time, the reader remarked, the exposures having been purposely cut short in order to test the pretensions of eikonogen as *the* developer for a really under-exposed plate, it must not be inferred that hydrokinone was the inferior of the two; indeed, his opinion was decidedly the reverse. Mr. Pinkney then proceeded to develop before the members two Thomas' lantern plates, two Ilford special lantern plates, and two pieces of Eastman bromide paper, with eikonogen and hydrokinone, the conditions being precisely the same as regards exposure of the plates and papers. It was clearly shown, 1st, that eikonogen was much slower than hydrokinone, and 2nd, that eikonogen produced a thin veil on lantern plates (which clearing would not remove) which was entirely absent with hydrokinone. The black tone on the bromide papers produced by hydrokinone was much preferred by the members to the cold grey by eikonogen.

A number of slides by members was then exhibited in Mr. James' lantern, kindly lent by him, and a flash-light picture of those present was taken by another member, Mr. R. B. Lodge.

The Sheffield Photographic Society.

The monthly meeting was held at the Masonic Hall, Surrey Street, on January 8th, Mr. B. J. Taylor in the chair.

It was announced that the winners of the President's prizes were as follows:—1st. Mr. E. Beck, with a picture entitled "With the Morning Tide;" 2nd. Mr. Thomas Hibbert, with "Cloud Effects."

It was arranged that an exhibition of prize lantern slides should be given at the next monthly meeting to members and friends. The Secretary reported that vice-president Mr. A. Davy had offered £2 2s., and Mr. Draper a bronze shield, to be given in prizes.

Messrs. Hibbert and Furniss gave a two-man lantern exhibition of their own work.

The Lewes Photographic Society.

A meeting was held on the 6th inst., at the Fitzroy Library, High Street, Lewes (where the future meetings of the Society will be held); the President in the chair. Mr. A. E. Venn was elected a member.

The evening was devoted to an exhibition of slides, over 200 being passed through the lantern.

An exhibition of members' work, with lantern entertainments and concerts, will be held on the 28th inst. Next meeting February 3rd, when a paper will be read by Mr. A. H. C. Corder on "Printing Processes."

The Croydon Microscopical Society (Photographic Section).

*Friday, January 9th.*—President (Mr. E. Lovett) in the chair.

Mr. A. W. Clayden, M.A., F.C.S., F.G.S., gave an interesting paper on the method of taking photographs of clouds for meteorological purposes. He also exhibited a camera constructed by himself especially for the purpose. The top of the stand carrying the camera is so small that any desired angle can be got without shifting the legs, and in the front of the lens, set at an angle of 33°, is a dark piece of highly polished glass; the photograph of the cloud being taken from the reflecting surface of the glass. By this means the actinic rays from the blue sky were polarized, or, so to speak, toned down, and facilitated the taking of fine cirrus clouds, which were impossible to get by the old method of pointing the lens straight at the sky. Solar halos can be taken with it, and, in fact, the ease with which fine, fleecy clouds within a little distance of the sun can be taken is very curious.

Many slides taken by this method were exhibited on the screen, consisting of fine forms of cirrus and cumuli clouds, and were notable for their brilliancy and depth.

The President, Messrs. Boyard, I. Weir-Brown, K. Mc.Kean, and W. Low Sarjeant, took part in a discussion that followed.

# Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Pharm.—*List of Members, Photographic Society.* It has been the custom to print once in three years, and the current list bears date February, 1889. For members elected subsequently you must consult the reports and proceedings *seriatim.*

S. Barnard.—*Focussing on Dark Days.* Use a candle flame held in a position corresponding to the plane of the object to be photographed; and, if necessary, move it over the field to ascertain whether you have secured the best all-round focus. Stoppages of water and gas in towns are frequent accompaniments of frost and fog.

Subscriber.—*Photographers' Benevolent Association.* 1. By the rules you are at liberty to nominate any other member for election into the committee at the forthcoming annual meeting in February. It would certainly be desirable to give notice of such intention to the honorary secretary, Mr. H. J. Beasley, 66, Chancery Lane, W.C. 2. Now all the offices are honorary, so that the only expenses are for printing and postage, beyond the payment of grants, as authorised by the committee. The claims this year have been exceedingly heavy, and timely assistance has been given to those applicants whose cases have stood the test of enquiry. On this account the funds of the Association require to be liberally supplemented if the good work is to be continued.

Nitrate Bath.—*Purification of Same.* With an old printing bath having a degree of concentration equal to 120 grains to the ounce, probably the best way would be to evaporate it down to dryness and heat the residue just to the point of fusion in a good porcelain dish. This would destroy organic impurities and get rid of free acid; but before doing this, however, we should be inclined to test a portion of the silver bath by diluting with an equal bulk of water, and shaking it up with kaolin. If paper sensitised with it prints well, be content to use it up in this way.

W. M.—Your manuscript will probably be accepted and utilised later on. The subject is one which does not urgently demand consideration at the present time.

G. L.—*The Oxford Photo-Prints.* The prices demanded for reproductions from the Bodleian manuscripts are certainly very moderate:—Three shillings for a 10 by 8 negative, and four pence for a silver print taken therefrom. Platinotypes and carbon prints of the same size are charged ten pence each. One hundred collotype prints, with clean margins, can be had for twelve shillings in addition to the price of the negative. Application to be made to the Controller of the University Press, Oxford, who is prepared to give estimates for larger sizes.

B. & S.—*Photo-Enamels.* You might enquire, in the first instance, of Mr. A. L. Henderson or Mr. C. A. Rudowsky. If neither of them will undertake your commission, apply to MM. Benque & Cie, of Paris.

J. T.—*Parent Society.* The premises are already open daily from 2 p.m. at 50, Great Russell Street. Nominations for new council must be sent in by Wednesday next, 21st inst., addressed to the assistant-secretary.

H. F. Smith.—*Developers.* Want of intensity in your case is due probably to the use of a weak developer, especially during this cold weather. The remedy is obvious. Both plates have recently given us excellent results.

M. P.—You are mistaken; the rainfall of last year was *below* the average, although July was so wet.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1690.—*January* 23, 1891.




CONTENTS.



## NEW DISCOVERIES IN PHOTO-ELECTRICITY.

An article by Professor Minchin will be found upon another page, setting forth some of his new discoveries relating to photo-electricity laid before the Physical Society last Friday, as well as some information about their relation to photography. Last Monday we had the pleasure of inspecting his apparatus, and receiving from him information as to his earlier and later methods of preparing the sensitive plates.

He uses two kinds of cells. One of them consists of a glass tube three or four inches long, as represented in fig. 1 of his article, in which tube is some pure methyl alcohol from oil of wintergreen, covering the two plates; platinum wires, sealed into the tube by heat, pass through the glass to the plates. The smaller plate is of absolutely clean, pure tin, a quarter of an inch long, a sixteenth of an inch broad. The larger and sensitive plate is one inch long and one-eighth of an inch broad. This one also is of perfectly pure tin, for any impurity, especially any trace of copper, promotes failure in the results. The plate is first cleaned with sodic hydrate, and afterwards with dilute hydrochloric or hydrofluoric acid; then it is laid upon a horizontal arm of porcelain so bent at the other end that, on raising from below a dish containing liquid, the said liquid covers the plate. By this method the second plate, or the one which has to be covered with a sensitive film, is immersed in the following solution:—

| | |
|---|---|
| Distilled water... | 500 c.c. |
| Nitric acid | 3 ,, |
| Nitrate of ammonia | 15 grammes |

The exact nature of the surface thus given to the tin plate is not known, but from the composition of the liquid it is probable that the effect is one of oxidation of some kind. The plate is left in the liquid about four minutes, and becomes covered uniformly with a whitish deposit. The solution is then removed by lowering the dish, and the under surface of the horizontal porcelain support is dried with blotting-paper. This dried under surface is then uniformly heated with a spirit flame moved about underneath until the liquid above has evaporated; the surface of the tin plate will then present a dirty slate colour. As the heating is continued, a point is reached at which a dark shadow passes over the whole surface of the plate; if the heating be now stopped, a sensitive plate is produced, but not one of the maximum sensitiveness. Upon continuing the heat the surface will change into a perfectly white one, and the heating should be continued until the thin vapour or smoke which is given off ceases to appear, and until the smell of nitrous acid entirely disappears. Care must be taken not to melt the tin in this process, and when the treatment is complete, the plate should be plunged into methyl alcohol from pure oil of wintergreen. A fine platinum wire has first to be fixed to the top of the plate, either by means of a solder with a low melting point, or by passing the wire through a little hole at the top of the plate and then bending the end of the wire back over the top edge; the latter plan is found to give sufficiently good contact for practical purposes. The clean, plain tin plate is sealed to the bottom of the tube by means of its platinum wire; after the methyl alcohol and the other plate are inserted, the upper part of the tube, with the wire from the second plate passing through it, is sealed by heat. All this may be done in daylight. The complete cell has to be left from two to five hours in the dark before it will exhibit its maximum powers.

In much which has just been stated, it may be noticed what a strong analogy exists between this method of preparing a sensitive plate, and one of the methods which Becquerel employed to produce a surface on a silver plate to adapt it to the taking of a photograph in natural colours.

The tin plate thus rendered sensitive, and mounted in a cell as described, when exposed to good diffused daylight, will exert an electromotive force—E.M.F. in electricians' language—of half a volt or more, as exhibited by means of the quadrant electrometer, and it will yield a steady stream of electricity for three or four hours, after which the E.M.F. falls off.

Supposing an exposure not to have been too long, the cell will gradually recover itself in the dark; if it be not exposed for more than ten minutes or so at a time, it will recover itself in the dark; one of the cells which has been used only in the latter manner has been so employed by Professor Minchin for four years.

According to the dynamic hypothesis of the invisible photographic image, the phenomena just stated may be explained on the principle that the shorter exposures do not result in the decomposition of the molecule, which decomposition the longer exposures effect.

Some of these cells are found to be "impulsion cells," that is to say, that they do not act until the support of the apparatus is tapped; a slight touch with a lucifer match is enough. The working of small frictional electrical machines will give an impulsion from a distance. If the alcohol in the cell be changed four or five times, the necessity for impulsion disappears.

More recently Professor Minchin has been working with selenium sensitive films. The plates are sealed in very thin little glass tubes, one-eighth of an inch in diameter, and about four inches long. At the lower end is a plate of pure aluminium cleaned by scraping. The plate above it, but not touching it, is of pure aluminium coated with a thin layer of selenium. Platinum leading wires pass through the sealed ends of the tube to the plates. The liquid used in this cell is pure acetone.

To prepare the sensitive plate, the zig-zag porcelain arm already mentioned has the aluminium plate held by a forceps upon its horizontal projecting end, and the arm and plate are heated from below by means of a Bunsen flame. A melted blob of aluminium is placed upon a hot glass rod, and while one hand holds one end of the plate by means of the forceps, the other hand, by means of the rod, smears the selenium over the plate in one uniform, black, viscous layer; at the same instant the gas flame is removed, and the aluminium plate taken rapidly off the porcelain arm, and waved rapidly three or four times in the air; then it is placed upon a comparatively cool part of the flat porcelain arm to anneal it, and any tendency to remelt is checked by blowing over the plate.

Next, the gas flame is worked uniformly under the porcelain arm bearing the plate. The selenium surface will then exhibit a series of changes: first of all, the black surface becomes slatey white, and, as the heating and blowing are continued, the slatey white will turn to a grey, which may be of several shades. Should it be a light grey marked by any glossy streaks or spots, the plate is to be rejected as not one of maximum sensitiveness; the melting and smearing process then has to be repeated all through until the surface finally obtained is uniform, and half way between a grey and a brown in colour, but decidedly brownish. Hitherto it has not been supposed that this is the colour for the most sensitive selenium.

The cell made with the two plates just described acts with great rapidity when exposed to light, and the E.M.F. disappears almost instantly when the cell is screened, but this quickness of action does not characterise the cell some days after it has been formed, although its sensitiveness is unimpaired. These selenium cells do not permanently deteriorate by any amount of continuous exposure to daylight, so far as is yet known; they have been made only about six months; they recover their powers always during the night.

Their maximum sensitiveness is in the yellow, but the whole of the rays of the spectrum give results not much inferior. The E.M.F. they yield under the action of good diffused daylight is from one-half to two-thirds of a volt. They will stand any amount of exposure to light while in open circuit, as when their E.M.F. is tested by means of the quadrant electrometer; but if the two wires from the cell be joined up so as to complete the circuit, the cell will then somewhat slowly deteriorate under the continuous action of daylight. Professor Minchin has joined up a battery of fifty of these cells, and with ordinary diffused daylight it gives an E.M.F. of twenty-five volts. One end of a strong local battery may be connected with the movable part of the electrometer, so the circuit shall be completed when the part is deflected. By means of this relay, the strong current resulting from the effects of the weak one may be made to do practical work, such as the ringing of electrical bells, or the automatic turning up of the gas when the daylight grows weak.

A favourite remark of Professor Tyndall is, that discoveries in one branch of science often throw light upon problems connected with another branch of science. These discoveries in photo-electricity, and the discoveries of Mr. Croft in relation to breath images, seem to give the power of attacking the mystery of the nature of the invisible photographic image from fresh standpoints.

## ABOUT INSTANTANEOUS SHUTTERS.

One of the most curious results of the introduction of rapid dry plates has been the amount of ingenuity and inventive ability which has been expended in designing and constructing shutters for instantaneous exposures. If the shade of Daguerre should haply have the opportunity of revisiting the earth, he would marvel that such things could be necessary, seeing that the time of exposure under his system entailed minutes rather than seconds, and although after Goddard's introduction of bromide in aid of the iodide of silver this exposure was very much lessened in duration, yet it was far too long to need the employment of any mechanical appliance to uncover the lens. But some form of instantaneous shutter soon became necessary when the collodion method superseded the Daguerreotype.

It is the fashion for modern photographers, and especially those who are recent aspirants for fame, to talk glibly of the shortcomings of collodion in the way of rapidity, and to imagine that it was as slow as the old Daguerreotype process. The truth is that they take very little pains to make themselves acquainted with the history of the art, and, after reading in a very cursory manner of the labours of Daguerre, Fox

Talbot, and other pioneers, they get rather mixed in their notions of the different processes which have, from time to time, been introduced, and jumble them all up together as things which were slow, and, generally, of little use. They are encouraged in their error, to some extent, by the ridiculous and mischievous method which has been adopted in some quarters of comparing the rapidity of a modern gelatine plate with the celerity of a wet plate, while anyone who has worked both processes will know that it is possible, by adjusting certain formulæ, to make a wet plate actually quicker than a modern dry one. Expert workers with collodion knew well that they could so compound their chemicals that a very quick plate was the result, and the instantaneous shutter was the natural outcome of their labours in this direction.

The simple drop shutter was no doubt the first thing of the kind which was thought of. Another form was that of a blind which travelled over a small roller, and so arranged that when one end was pulled downwards the other was raised. This form of shutter, although not very quick in action, had several advantages, the chief of which was that the operator, string in hand, could make the length of exposure suit the subject in hand, and could give a longer exposure to the foreground than to the sky. We have in our possession a shutter of this kind made about thirty years ago by the late Mr. Dallmeyer, and a good testimonial to its efficiency is seen in the circumstance that the idea has been patented, and brought out as a new thing within recent times.

It was about thirty years ago that Breeze produced his wonderfully effective studies of sky and sea for the stereoscope, and anyone looking at these beautiful pictures must acknowledge that some sort of shutter must have been used in their production. Of course, a very quick shutter was not used in those times, but it is a fact that the old, and in some quarters despised, wet collodion process would yield a picture of such a bright subject as sky and sea in a fraction of a second.

In our humble opinion, many of the shutters now made are far too elaborate in construction to bear the wear and tear of ordinary work. Some are almost as complicated as watch movements, and, although they are most ingenious in design, they will not bear rough treatment, and apparatus which is intended for out-door employment must be prepared, in our English climate, to rough it a little. One shutter was shown to us lately which, its owner told us, refused, at a critical moment, to do the work expected of it. We examined it, and found that its working parts were choked with woolly dust. Its proprietor had carried it in his pocket, and it had quickly picked up the *fluff* which invariably gathers in such a receptacle. How many shutters there are which would, after such treatment, also refuse to move. Some, indeed, have to be kept in special dust-tight cases to preserve their delicate constitutions.

Of course, in the taking of certain subjects, such as a trotting horse, a jumping dog, a lawn tennis player, or a diver, the shutter must work at a high speed, and somewhat complicated arrangements may be necessary to secure this end. But we believe that for ordinary purposes the more simple in design that a shutter can be made the better. Another important consideration is that these complicated arrangements require a great deal of attention in the way of previous calculation and setting, and thus the operator's brain is busy upon a tiresome detail of his work, instead of being devoted to the main business of watching his picture.

## PHOTO-ELECTRICITY.

BY PROFESSOR GEORGE M. MINCHIN.

The generation of electromotive forces and currents by the action of light on various metallic plates whose surfaces are prepared by special processes has been the subject of very numerous experiments by me since the beginning of the year 1877. The investigations treated of in the paper which I read before the Physical Society last Friday may be briefly summarised under the following four heads:—

1. The electric currents obtained by the action of light on silver plates coated with emulsions of various salts of silver, such as chloride, iodide, nitrate, and bromide (Liverpool emulsion). These, when powdered and emulsified with collodion or gelatine, were spread over clean strips of silver foil fixed on glass plates; two such plates were immersed in a glass vessel containing water in which were dissolved a few grains of chloride of sodium, iodide of potassium, nitrate of barium, or bromide of potassium; one plate was screened from light and the other exposed, both were connected with the poles of a sensitive galvanometer, and then currents were produced the directions of which depended on the nature of the emulsion on the plates. The electromotive forces developed thus depend, of course, on the intensity of the light, but with diffused daylight they are not high; they may amount to about $\frac{1}{20}$ of a volt.

The plates were also coated with emulsions of various aniline dyes, such as eosine, iodine green, and naphthaline red; the currents produced by the first were comparatively large.

The most important observation under this head was the *photographic action of the current*. It was found that if a current from a bichromate cell were passed for a few seconds through a cell containing two silver plates, each coated with a layer of Liverpool emulsion, and each about half immersed in water holding in solution a few grains of bromide of potassium, on removing the silver plates from the cell, that which was connected with the carbon pole was visibly blackened on its immersed part, while no visible effect was produced on the other; but, on developing this plate with pyrogallic acid and ammonia, its immersed part also became dark, exactly as if it had been exposed to light for a few seconds. This photographic effect was also produced by replacing the bichromate cell by a photo-electric cell, whose plates were coated with an eosine emulsion, one of these being screened, while the other was exposed to light. The photo-current generated by the latter cell passed for an hour or so through the former silver bromide cell, which was kept in a dark room, and when the plates of this latter were removed and developed, the photographic darkening took place, as before, on the immersed parts of the layer of Liverpool emulsion. This action could have been accelerated by first exposing the plates of this cell for a few seconds to gaslight.

Another important observation in this connection is the *localisation of the photographic effect* on the parts of a sensitised plate through which a current passes. For this observation several narrow strips of silver (1, 2, 3, 4, . . . .) were cemented close together on a glass plate, and the whole plate was coated with a layer of Liverpool emulsion; this plate was immersed in the presence of a clean silver plate in a cell containing water and bromide of potassium; the strips (1, 3, 5, . . . .) were all connected together, and with one pole of a voltaic cell; the strips (2, 4. 6, . . . .) were left out of the circuit; the clean silver plate was connected with the other pole of the voltaic cell, and both plates were about half immersed. The current having passed for a few seconds, the sensitised plate was removed and developed, and it was found that the darkening took place only on the immersed parts of the strips (1, 3, 5, . . . .) through which the current had passed.

The object of this experiment was to prove the fundamental possibility of the solution of the problem of seeing at a distance by means of an electric current. Various other metallic plates besides silver, such as copper, bismuth, and iron, were also tried, but the results are of minor importance.

2. Plates of tinfoil fixed on glass have been the subject of long investigation. As the tinfoil comes from the manufacturer, with its surface not specially treated in any way, if a glass cell containing two such plates is filled with water, and the plates (one of them screened) are connected with the poles of a sensitive galvanometer, it will, in nearly all cases, be found that rather strong currents are produced when the other plate is exposed to light. The exposed plate may be either positive or negative towards the unexposed. If the former, the action of strong light continued for a few minutes will often change the sign of the E.M.F.

A tinfoil plate which is negative towards a clean plate in a cell can be obtained by cleaning its surface with sodic hydrate, and then with dilute HCl, and exposing it to the action of $SH_2$, or rubbing a little mosaic gold on its surface. A plate which is positive is obtained by a special process involving some trouble. Its surface having been thoroughly cleaned, it is laid on a fixed glass or porcelain plate, which is immersed in a solution composed of 500 c.c. of distilled water, 3 c.c. of pure nitric acid, and 15 grammes of nitrate of ammonia. After about four minutes' immersion the surface is covered with a uniform white deposit, and the vessel containing the solution is withdrawn. Then the under surface of the glass or porcelain plate is dried with blotting-paper, and the heat of a spirit lamp is uniformly applied to this under surface. The liquid having been then quite evaporated, the surface of the tin undergoes a series of visible changes, resulting finally in a very white layer resembling the white oxide of tin. The plate is then suspended from a fine platinum wire, and sealed into a small glass tube containing methyl alcohol in presence of a clean tin plate similarly sealed into the tube. For the successful production of this surface the tinfoil must be pure; the thin German tinfoil which purports to be pure is not suitable. The strip of foil usually taken is about 1 inch long and about $\frac{1}{8}$ inch wide, its thickness being about that of stiff note paper. On connecting these plates with the poles of a sensitive quadrant electrometer, and exposing the cell to diffused daylight, an E.M.F. of as much as $\frac{2}{3}$ of a volt can be obtained. Its maximum sensitiveness will usually be developed in a few hours after the cell is sealed up and kept in the dark.

Cells formed thus—the alcohol not being, of course, renewed—almost invariably develop a most curious property, from which they are called *impulsion cells*. A day or so after they have been set up, on exposure to light they indicate no E.M.F. whatever, or in some cases a negative E.M.F.; but a slight tap given to the base or support of the cell at once restores their original sensitiveness to light, and another tap destroys it, and so on. The change from the insensitive state to the sensitive can also be effected by the inductive action of the spark of a frictional machine, such as the ordinary gas-lighter, or by the spark of a Hertz oscillator at a great distance from the cell; in the case of one such cell this effect was observed to take place, when the Hertz was eighty-one feet from the cell. In some cells (owing, no doubt, to some want of uniformity in the layer on its surface, or in the heating) a portion of the plate may be found to possess, on exposure, the impulsion property, while the remaining portion remains unaffected by impulses, and always positive. It has been observed that if a cell is not sealed up, but closed by a removable cap, the impulsion effects are made to disappear by simply replacing the alcohol by fresh alcohol as often as these effects repeat themselves. Thus, in one such cell made four years ago, the alcohol was renewed on six successive days, and then the impulsion results ceased, the cell having ever since remained sensitive and the plate positive.

A curious result with a sensitive cell was obtained by connecting it through a very high resistance—about 10 megohms—with a Daniell cell. When connected in such a way that the action of light on the cell was opposed to that of the Daniell—*i.e.*, the Cu pole of the latter with the sensitised plate—the action of light was about five times as great as when the connections were reversed.

These cells are deteriorated by continuous exposure to strong light for several hours, and when the light is withdrawn the E.M.F. generated by it disappears very slowly; but this residual effect can be rapidly, and without injury, pumped out of the cell by connecting the cell in the first of the above ways with a Daniell by means of a make-and-break key; a few seconds' connection, followed by short circuiting, leaves the cell as it was originally. The following figure gives a view of the cell—without its support,

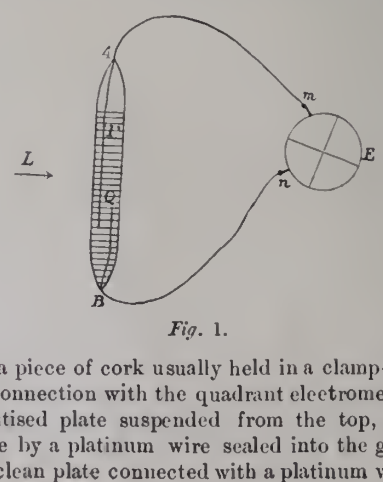



*Fig.* 1.

which is a piece of cork usually held in a clamp—together with its connection with the quadrant electrometer. P is the sensitised plate suspended from the top, A of the glass tube by a platinum wire sealed into the glass at A; Q is the clean plate connected with a platinum wire sealed to the tube at B; $m$, $n$, the poles of the electrometer E: L, the direction of incident light.

3. A new cell in which selenium plays a part was recently discovered. The selenium "cells" hitherto known are copies of that made by Professor A. Graham Bell, and used in the photophone. They are not properly "cells" at all, since they are not used to generate E.M.F. They are merely portions of the circuit of a voltaic battery, and it is their variability as resistances under the action of light which has been employed.

After many experiments with various metals and liquids, I found, last summer, that by smearing a uniform thin layer of melted selenium on a small plate of aluminium, about half an inch long and about $\frac{1}{16}$ inch broad, and then gradually heating and cooling the plate on a porcelain plate, the selenium surface passes through a series of visible changes—exactly as the tin plate does—the final surface aimed at being a uniform brownish one, not exactly a grey, as is generally supposed to be the best, the most sensitive plate is produced. In the heating and cooling process there are various shades of grey, marked by glossy spots or streaks, which most readily present themselves as the final surfaces; but they are all to be rejected. On the average, a sensitive plate takes ten minutes to make. It is sealed into a glass tube, as in fig. 1, in presence of a very small clean plate of aluminium—this latter may be of the size of the head of a pin—the tube contains acetone, which is found to be the best liquid. The cell is called a *seleno-aluminium cell.*

Such a cell develops a large E.M.F. in all parts of the spectrum, the maximum being in the yellow. Diffused daylight will give more than half a volt. The cell, if not short circuited, does not appreciably deteriorate by continuous exposure during the day; recovery takes place at night.

By means of the E.M.F. developed by a battery of twelve

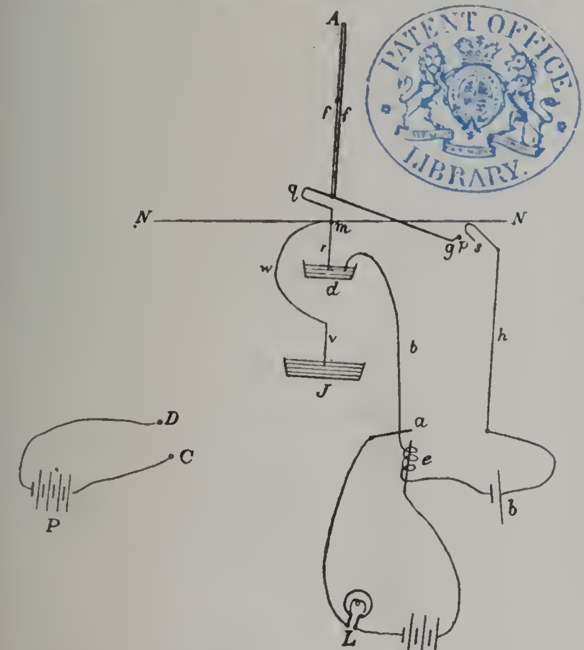





*Fig.* 2.

of these little cells, an electric bell can be rung by the light of a taper or a match. The sensitised plate is always negative. The above (fig. 2) represents the arrangement for lighting an electric lamp, ringing a bell, &c., by means of the E.M.F. of a photo battery P, connected with the poles C D of a quadrant electrometer whose needle is N N, the quadrants not being represented. A very fine glass tube, $g\ q\ m$, passes through the middle, $m$, of the needle, and a platinum wire, $p\ g\ q\ m\ r$, runs through this tube, dipping at $r$ into a flat mercury dish $d$, into which also dips a platinum wire $t$, connected with one end of the coil of a small electro-magnet $e$, the other end of the coil being connected with one pole of a weak voltaic cell $b$, whose other pole is connected with a small platinum plate $s$, inside the case of the electrometer, and held close above the quadrants, and also close to the position of rest of the end $p$ of the platinum wire $p\ g\ q\ m\ r$. The needle is charged from the sulphuric acid jar J, by a fine platinum wire $w\ v$, of which the part $w$ is bent into a semi-circle round the outside of the dish $d$ (so as not to touch $d$ in the motion of the needle), and the part $v$ is vertical, and under the centre $m$. When, by means of the E.M.F. of the photo-battery P, the point $p$ touches the plate $s$, the circuit of $b$ is complete, and, at the same time, the motion of the armature $a$, of the electro-magnet $e$, completes the circuit of a strong battery B, in whose circuit is a lamp. The needle is suspended by fine silk fibres $f\ f$, passing round the glass arm $g\ q$. The portion $g\ q$ of this glass tube is at right-angles to the long diameter of the needle N N.

The possibility of the solution of three problems in photo-electricity was touched on. Firstly, it was pointed out that some scientific comparison of the relative values of two different lights might be effected by some such cell as the seleno-aluminium, owing to its giving such large results in all parts of the spectrum. Secondly, the problem of telephotography, or seeing at a distance, was mentioned. It does not, at present, seem to be very near solution by any satisfactory process; but, doubtless, it will yet be effected. Thirdly, the question of utilising the energy of the solar rays for performing useful work by means of photo-electric batteries, which would act merely as transformers of energy without consumption of their own materials, was discussed; and I ventured to dispute the inference usually made from the pyrheliometer experiments of Pouillet and Violle, viz., that the solar rays at the distance of the earth have not enough power for the object in view. It was shown that, according to Pouillet, we receive from the sun about sixty-three foot-pounds' weight per second falling normally on a square foot of surface, and about ninety-one, according to Violle. Neither amount is large, but it may possibly be that, by catching a solar beam on a blackened surface, we do *not* succeed in transforming *every kind* of energy in the beam into heat. In the solar rays there may be forms of energy which take no notice of blackened surfaces, and, if so, it may be possible to discover some receiving surface which, employed in a photo-electric battery, will transform more energy than is accounted for by black bulb experiments. This was put forth as an encouraging possibility to the experimenter in opposition to the commonly received dogma of the necessary transformation of all kinds of energy into heat, and the consequent death of the whole "visible" universe, as portrayed by Tait and Stewart.

---

OF the one-man and one-woman exhibitions of photographic work yet held at the Camera Club, we take it that an overwhelming majority of the members of the Club would vote in favour of Mrs. Cameron having produced the finest artistic results in portraiture. Probably portraits of the type she executed would take well with the cultured section of the public at this time.

## DR. EMERSON'S RENUNCIATION OF NATURALISTIC PHOTOGRAPHY.

DR. P. H. EMERSON has just issued a pamphlet with a black-edged border on the cover; the title of the essay is "The Death of Naturalistic Photography," and he writes as follows:—

DEAR SIR,—Will you reprint this *in full* in the next issue of the PHOTOGRAPHIC NEWS. It is copyright, but I hereby give you full permission to reprint it.—P. H. EMERSON.

The pamphlet is preceded by the following motto:—

"If offence come out of truth, it were better the offence come than the truth be concealed."—FRANCIS BACON.

Then comes the utterance itself:—

A RENUNCIATION.

*To all Photographers.*

LOVING Brethren that were, I salute you. I owe you one apology, oh! my friends, for in the earnestness of my heart I *partly* misled you. You, who stuck by me in storm and stress I shall never forget—if any of you, after this renunciation, seek advice, ask and you shall receive of my best. You, enemies, who will now rub your hands with small-souled glee, rub on, till it all ends in imaginary soft-soap. You, whom I have in mistaken zeal attacked, pray forgive and forget.

And now list. I, saner than ever, renounce and abjure all theories, teachings, and views on art written, and first promulgated by me in sundry works, articles, &c., and finally collected in a volume, entitled "Naturalistic Photography." I cast them upon the dust-heap.

I am for the present and future neither idealist, realist, naturalist, nor impressionist—*photographic impressionist** indeed!—as though ALL graphic artists were not impressionists, and as if the photographic process could give aught but transcripts more or less literal. Shall I, forsooth, explain this burning of books?

List, you who have ears to hear and eyes to see.

In the fulness of my heart I dreamed a dream. I thought art might be taught by writing. I was wrong, I confess. I, even I, "the lover of nature"—everyone is that now—preached that all art that did not conform to "truth to nature" principle was bad—that was a fatal sermon to many. From this followed again the idea—mistaken, alas!—that photography *pure*—not impure, on rough papers, touched up by clumsy hands—was an art surpassing all black and white methods. *Eheu!* That this was ever believed! However, I was sincere, enthusiastic, but mistaken, and I was and am no amateur. I have by the sweat of my brow learned, under a master, something of this thing they call art. Being no amateur, I have therefore left the Camera Club, the home of the "amateur." But ye reasonable ones in photography—some of you *are that*, true and worthy sons of the goddess Science, who has little to do with the goddess Art—you will ask, and with right, why this thusness? I respect you true workers in science—ye Abneys, Dallmeyers, Hurters, Driffields, Vogels, Jones, Harrisons, Bolas, Waterhouses, Eders, and others. I will tell you, for the vulgar mob of pseudo-scientists have done naught but prove their ignorance and show signs of the itch—the itch for publicity and venom.

To you, then, who seek an explanation for my conduct, Art—as Whistler said—*is not* nature—is not necessarily the reproduction or translation of it—much, so very much, that is good art, some of the very best—is not nature at all, nor even based upon it—*vide* Donatello and Hokusai.

* "A term consecrate to charlatans," and especially to photographic impostors, pickpockets, parasites, and vanityi-ntoxicated amateurs.

The limitations of photography are so great that, though the results may and sometimes do give a certain æsthetic pleasure, the medium must always rank the lowest of all arts, *lower than* any graphic art, for the individuality of the artist is cramped; in short, it can scarcely show itself. Control of the picture is possible to a *slight* degree, by varied focussing, by varying the exposure (but this is working in the dark), by development, I doubt (I agree with Hurter and Driffield, after three and a-half months' careful study of the subject); and, lastly, by a certain choice in printing methods.

But the all-vital powers of selection and rejection are *fatally* limited, bound in by fixed and narrow barriers. No differential analysis can be made, no subduing of parts, save by dodging; no emphasis, save by dodging; and that is not pure photography; impure photography is merely a confession of limitations. A friend once said to me, "I feel like taking nearly every photograph and analyzing it." Compare a pen and ink drawing by Rico or Vierge, in Pennell's book. I thought once—Hurter and Driffield have taught me differently—that true values could be obtained, and that values could be *altered at will* by *development*. They cannot; therefore, to talk of getting the values in any subject whatever as you wish, and of getting them true to nature, is to talk nonsense.

It is impossible in most subjects to alter your values *as you wish*, and to talk of such things now is mere emptiness and puffed-up humbug.

Some amateurs, following Colonel Noverre's REVIVAL of rough printing-papers LAST YEAR (1889), have thought that salvation lay in rough surfaces. Colonel Noverre's dust-heap was ransacked, and we have heard of a "new departure," a new "school," and all the bleat of the overweeningly vain "amateur."

If there can be no scientific basis for an art, as some have asserted, Meissonier can claim to be as artistic as Monet, and Monet as Meissonier. The sharp photographer can assert his artistic rights alongside of the veriest "blottist." So all opinions and writings upon art are as the crackling of thorns beneath the pot. In short, I throw my lot in with those who say that photography is a very limited art. I regret deeply that I have to come to this conclusion. Photography is first of all the *handmaiden of art and science*. It has and will register new facts of light, form, and texture. Pure photography is a scientific method of drawing, and scientists should work on until a true and literal scientific transcript of nature can be made—this by orthochromatics, &c.

It will interest some to hear what I think of some points that have been vexed questions in a war I have, I regret to say, stirred up. Composition, as understood by Burnet and others, I hold to be futility itself, though I can appreciate the attempts to meet the difficulties in this matter. The eternal principles of art I have heard so much of are mere catchwords.

*Sharpness v. Diffusion.*—If the work is for scientific purposes, work sharply; if for amusement, please yourself; if for business, do what will pay.

I have—I regret it deeply—compared photographs to great works of art, and photographers to great artists. It was rash and thoughtless, and my punishment is in having to acknowledge this now. Think of the marvellous dexterity of the man who with pencil, pen and ink, or paint and brush, produces a masterpiece, the drawing equal to that of the lens, the tones in harmony, the colour delicate and marvellously beautiful. Read Rood's "Chromatics" for a hint of the manifold difficulties surrounding this subject. Then think of the amateur photographer who, if clever, can *in a few weeks* turn out good, technical work.

It may be asked, then, what theories on art I have. I answer, at present, *none*. What artists I admire? I answer, all good artists and all good art. To what school do I now belong? None. What do I think of writings upon art and art criticisms? Mistakes.

A final word. Suggestions have been made that I get some of my ideas from a book called "Naturalistic Painting." I have a letter in my possession from an artist, wherein is stated clearly and exactly that Mr. Bate* had read a paper of mine on "Naturalistic Photography" *before* his first article appeared in the "Artist." At the Society of Arts the other day, a paper was read by Mr. Davison—an amateur without training, and with superficial knowledge—in which my *old* ideas were freely and impudently handed about, and no credit given me. It was whispered about by my enemies that this person had originated some of the ideas of Naturalistic Photography. To enlighten the public, I append a quotation from his letter to me on this point. There are plenty more confessions of "his lack of knowledge"; that his articles were "drivel"—it is his own word—and other confessions of incompetence and proofs of plagiarism, if necessary. He is now welcome to my cast-off clothes if he likes—he or anybody else. It is with deep regret I do this thing, and it is only as a duty to myself. I justify myself by stating that I wrote privately to Mr. Davison, expostulating with him for freely appropriating my ideas, and telling him that if he did not give me full credit at the Society of Arts, I should publish a history of the matter. He never replied. He can publish my letter in full if he likes. This was Mr. Davison's reply to a letter I wrote to him and others asking them if they minded me thanking them in public for their support. His reply is dated from the Camera Club, Dec. 16th, 1889, ONLY A YEAR AGO. It is, "I AM GLAD AND PROUD TO BE IDENTIFIED IN ANY WAY WITH NATURALISTIC PHOTOGRAPHY, BECAUSE I BELIEVE IN WHAT I UNDERSTAND IT MORE AND MORE CLEARLY TO BE, BUT I DOUBT VERY MUCH WHETHER ANYTHING I HAVE DONE DESERVES RECOGNITION."

I sent a copy of "Naturalistic Photography" some time ago for review to the editor of the *Journal of the Society of Arts*, and it got a bad notice. All the ideas offered the other night were thus offered to the Society *previously*. Lastly, a special speech, read from a paper by a friend of mine, especially pointing out how I had originated these ideas, was not reported as it was read, the printed report giving altogether a different impression from what the speaker said. Those who heard the original can refer to the speech, as reported in the *Journal of the Society of Arts*—not Artists, as Mr. J. Pennell has aptly described it. This sort of treatment, which is nothing new to me, may excuse some of my bitterly written invectives.

Finally. Some of my friends to whom I have recently privately communicated my renunciation, have wished to know how it came about. Misgivings seized me after conversations with a great artist after the Paris Exhibition; these were strengthened by the appearance of certain recent researches in psychology, and Hurter and Driffield's papers; and, finally, the exhibition of Hokusai's work and a study of the National Gallery pictures after three and a half months' solitary study of nature in my house-boat did for me.

*P.S.—Will every secretary of every photographic society take four wafers and a sheet of black paper, and hide for ever the words "To the Student" in pictures of East Anglian life.*

L'ENVOI.

Having taken some earnest photographers a little way into the art world, I feel it my duty to say that, when I have *fully* reconsidered the limited art possibilities of photography and the general philosophy of art, I will write another book; in the meantime, let students avoid all spurious imitations.

Lastly, Dr. Emerson gives the accompanying epitaph on the cover of his pamphlet:—

EPITAPH.

In Memory of
NATURALISTIC PHOTOGRAPHY,
WHICH RAN A SHORT BUT ACTIVE LIFE,
UPSET MANY CONVENTIONS,
HELPED TO FURTHER MONOCHROME PHOTOGRAPHY TO THE UTMOST OF ITS LIMITED ART BOUNDARIES,
STIRRED MEN TO THINK AND ACT FOR THEMSELVES,
PRODUCED MANY PRIGS AND BUBBLE REPUTATIONS,
EXPOSED THE IGNORANCE OF THE MULTITUDE,
BROUGHT OUT THE LOW MORALITY OF CERTAIN PERSONS IN THE PHOTOGRAPHIC WORLD,
BROKE DOWN THE PREJUDICE OF THE OUTSIDE PUBLIC AGAINST PHOTOGRAPHY'S VERY SLENDER ART CLAIMS,
ENCOURAGED MANY AMATEURS TO BABBLE AND MAKE THE WORDS "ART," "TRUTH," AND "NATURE" STINK IN THE NOSTRILS OF SERIOUS ARTISTS,
ENDING BY GIVING A FEW A BRUTAL SORT OF APPREHENSION OF ART, AND DYING WHEN ITS ALLOTTED TASK WAS DONE WITH A GIBE ON ITS LIPS,
FOR THE "AMATEUR," THE "PLAGIARIST,"
THE "PRATING TRUE-TO-NATURE MAN,"
THE "IMPRESSIONIST," THE "NATURALIST," THE "IDEALIST,"
AND THE HUMBUG.

---

THE Fourteenth Annual Stanley Cycle Show, open at the Crystal Palace from the 23rd to the 31st inst., is far more interesting than any of its predecessors, several novel features being introduced. Mr. E. R. Shipton, secretary to the Cyclists' Tourist Club, will, on Monday evening next, read a paper on improvements in the manufacture of tyres, and sections of the various tyres will be shown on the screen by means of lantern slides.

SOLUTIONS OF CELLULOID.—Dr. Charles Ehrmann writes:—"Alcoholic solution of celluloid has been said to be an exceedingly fine retouching varnish. But celluloid is in reality not more soluble in alcohol than ordinary gun-cotton or xyloidine. When small and tiny shreds of celluloid are macerated in alcohol of nine-five per cent., the substance swells up like gelatine does in water; the alcohol permeates its pores and dissolves the camphor contained, so that the final result is a solution of camphor, nothing else. We do not deny that a thin stratum of camphor upon the gelatine film will assist materially retouching with a graphite pencil, but the medium is by no means celluloid, which has proved to be so excellent to retouch upon. After macerating the celluloid in alcohol, and a thorough dissolution of camphor, washing it in water and drying, it will burn with detonation, exactly like gun-cotton does—proof enough that the alcohol had no other effect upon it than that above stated."

* This does not imply that Mr. Bate took any ideas from my paper; on the contrary, I feel sure his ideas were his own, as were mine.

## Literary Notices.

Optical Projection. By Lewis Wright. (*London: Longmans, Green, and Co.*, 1891.)

This book, issued last Monday, is a first-class one in relation to some of the principles of construction and use of the lantern, also in relation to the application of the instrument to demonstration purposes at scientific lectures. Much of it is the result of original and previously unpublished research relating to the construction of lanterns, and the optical and mechanical details relating thereto, in which the author was aided by Mr. Herbert C. Newton.

The first chapter lays down elementary principles and conditions of optical projection, such as are well known to many photographers who use the lantern, but are not so well known to the general public. Farther on, Mr. Wright deals with practical details, and we soon come upon the following useful little suggestion about the value of two side doors to the lantern:—

> Where exhibitions may have to be made in various places, it is of some importance to have a door on *both* sides of the lantern. Most people work from the right side (as the lantern faces the screen), but this is not always possible, especially with experiments. In all lanterns used with the lime-light, each door should be furnished with a sight-hole glazed with dark *blue* glass, through which the state of the lime can be examined without dazzling the eye. For a lantern used only with paraffin oil, sight-holes are useless, the flame being examined through a sight-hole at the back of the lamp.

The contradiction in terms in the last sentence of the above quotation is evidently a slip.

The subject of the best form of condenser is one in which the photographic public, at present, take more interest than in any other connected with the lantern; this problem is dealt with at some length, aided by numerous illustrations. For ordinary use, with lantern slides of the common size, the author recommends the condenser now in ordinary use, consisting of two plano-convex lenses with their convex surfaces nearly in contact, and says that, with an oil light, it is better than the double convex and meniscus combination devised by Sir John Herschel. About the merits of double *versus* triple condensers, he says:—

> Condensers of three and even four lenses have been used, especially in America. Theoretically, they admit of more perfect corrections for aberrations, and a larger angle of light; but this is complicated by the number of extra reflecting surfaces. I have perfectly satisfied myself that for exhibition lanterns they afford no gain whatever. For large condensers, as five inches and over, and where the light is to be condensed upon a *small* surface, as for the projection microscope, they are of advantage, and allow us to use a pencil of 90°.

In the above paragraph we have the elements of strong contention among authorities in relation to the lantern. Many of the improvements in the optical lantern during the present generation have had their origin in America, and that class of condenser which is largely in use among experienced lanternists in that country is thus condemned by Mr. Wright. Mr. Traill Taylor, who is known among photographers as an authority upon this subject, has published that, with a triple condenser, the gain in illumination of the disc is great, and has illustrated his remarks by a diagram, from which it would appear that the amount of light passing through is nearly doubled by the use of the third lens. Sir R. Ball, Astronomer-Royal for Ireland, once brought his own lantern to the Royal Institution, to use in projecting diagrams and pictures during his lectures, and it had a third lens fitted up inside, to throw more light upon an ordinary condenser. Was this done because of a mistake in practical optics? In some condensers of good design it is necessary to have them a little larger in diameter than the common one, to well cover a slide of the same dimensions, but this is no practical objection, for it merely means a little extra first cost with no subsequent extra expenses. The triple-condenser men, of course, admit the slight deteriorating influence of two extra reflecting surfaces, but assert it to be of practically no importance as compared with the extra amount of light transmitted.

Mr. Wright, in his just-quoted paragraph, admits the triple condenser to be right theoretically, and, instead of authoritatively saying that it is of no use practically, he should have given a demonstration of the truth of the assertion, for in these turbulent times, and in this scientific age, a stiff-necked generation demands proof, and pays little deference to the voice of authority, the accumulated experience of mankind having taught men the folly of doing otherwise. The best results are always obtained by true theory and true practical application going hand in hand, but Mr. Wright demands that, in this matter, they shall be divorced. This problem is one of the most vital importance connected with the lantern, for it involves the question of how to obtain the maximum of illumination with the minimum of light and heat.

That the third lens may sometimes give a condenser more liable to be cracked by heat seems no valid objection; the third lens should be thin, and so mounted as to be easily and quickly replaced by another should it get cracked, and, from its smaller diameter, it need not cost much; it may, moreover, decrease the liability of the other two and more expensive lenses to crack. Moreover, a skilful worker is not likely to crack a properly made condenser; he will take care not to heat the lantern too rapidly. A private individual has difficulty in thoroughly investigating this matter for himself, because to do so requires a number of lenses differing in curvatures and focal lengths, which there might be difficulty in obtaining in the market, and he would require special appliances for the relative centreing and otherwise adjusting.

The public will not allow the flat contradiction in statements by authorities upon lantern condensers to rest where it is, now that the instrument is in use in the home of nearly every photographer, and is everywhere growing in popularity. The users of the lantern are sure to take steps to get the maximum of illumination of the screen with the lowest possible amount of light in the lamp. The trade will respond to the demand, but, perhaps, will not initiate any change, for trade is slow in quitting its established channels. Meanwhile, Mr. Taylor's recent utterances at the Camera Club on English and American condensers laid down true principles, and we think it likely that he will in the end come out of this contention by proving himself to be right, and Mr. Wright wrong. Mr. Wright uses a triple condenser himself in his own oxy-hydrogen microscope; why not, then, in the ordinary lantern? One can quite understand that by taking any common double condenser, and any smaller lens that may be handy, the three together may not give an improved result, from unsuitability of the focal lengths and curves of the three elements; but any such method of testing a principle is unscientific, and likely to lead to false conclusions.

The author expresses the following opinions about condensers:—

Condensers are usually made of crown glass, density about 1·516. This answers perfectly for ordinary purposes; but for the highest glass of modern exhibitions, which have to cover large screens of twenty to thirty feet diameter, sometimes at great distances, it is objectionable, as the green colour absorbs light which can ill be spared in such circumstances. Chance's "optical" flints, of course, leave nothing to be desired in this respect, but condensers so made are very expensive; in some cases, however, they are worth while, as the glass is both more colourless, and the lenses are *thinner* for the same focus. A more common flint would answer practical purposes, and it is desirable that some colourless glass should be introduced if possible, rather than green crown. This need not make them so very much more expensive; for while "optical" flint must be homogeneous, and is usually wanted dense for a condenser, a perceptible amount of *striæ* is of little practical importance, and density is not required, only colourlessness. It is utterly useless to pay the cost of optical perfection in a condenser for any ordinary purposes. A perceptible bubble in the lens next the slide, however, would be a defect of importance, probably showing as a black spot. It is very likely that many purchasers would reject a colourless lens with perceptible striæ, rather than a crown lens which showed none; nevertheless there can be no question that the first would be the better condenser, unless the striæ were excessive.

The point most commercial condensers chiefly fail in, however, is that the lenses are not ground *thin at the edges*; nearly all lantern makers being far too careless in this respect. Not only is a needlessly thick lens much more likely to crack, and more absorbent of light, but it is distinctly worse in optical performance. The lenses should be ground to as nearly knife-edges as possible, being only just edged down for fixing into their cells.

Both lenses should be mounted so *loosely* in their brass cells that they can be turned round with the fingers, else they may crack merely from expansion when heated, and they often become hotter than the hand can bear. Holes must be pierced in the margin of the cell, to allow of the escape of the aqueous vapour which always forms when the lantern is first lit. Only the back lens ever cracks from heat alone. If the crack be irregular, the lens must be replaced; but it often happens that the crack is quite straight across a diameter, in which case the cracked lens will answer perfectly well if the crack is arranged perpendicularly, and the operator may feel certain that his lens will never crack again.

In speaking of single lenses as compared with photographic portrait lenses—or modifications thereof—for projections, Mr. Wright gives useful information about a French single combination, consisting of a concave lens of flint cemented between two double convex crown glass lenses, the whole then assuming a double convex form. Mr. Wright says:—

Some of these lenses perform exceedingly well. They were used a great deal by Mr. Dancer for his lanterns, and I possess a pair of them, 6-inches focus, whose performance can hardly be distinguished from that of the best of the construction next to be described. They appear to me to combine flatness of field, evenness and sharpness of definition, and ortho-symmetry of image, in a greater degree than any other single lenses, and I think it is to be desired that more attention should be directed to this construction for long focus work. My pair of 6-inch lenses have a clear diameter of $1\frac{3}{4}$ inch, and require a 1-inch stop placed about $2\frac{1}{2}$ inches in front to produce their best effect. In this position the stop cuts off scarcely any rays of serious importance, and the image of a slide of printed matter is exceedingly good. For lenses of 9 inches focus and upwards no stop whatever would be required, and such lenses would be much cheaper, and pass more light than double combinations.

The chief points to be attended to in projection lenses are to see that they are of sufficiently large diameter to take in all the cone of rays coming from the condensers, and that they give a flat field combined with good definition.

About the petroleum oil for use in lamps, Mr. Wright says that the "common trash" often sold as "paraffin oil" should not be used, and that much of it "is not safe to use in any lamp, and none of it gives a good light;" only the best refined paraffins should be used. If such dangerous oils are in market, and in weather, too, when there is a run upon them for household purposes, the Government should be made aware of the infringement of the law as regards the flashing-point of the said oils. Notwithstanding the hundreds of tons of such oils burnt in London for heating purposes during the recent severe weather, we are not aware of a single accident therefrom having been recorded in the newspapers.

In relation to oil lamps, a word of warning might have been uttered in the book, about those of faulty construction, so made that the light cannot, in certain cases, be brought so near to the condenser as when the limelight is employed. Information also might, with advantage, have been given about the merits of circular wick lights, such as yielded by Trinity House two-ring burners, as compared with the ordinary three-wick lamps, and the slight unevenness of illumination of the screen given by the latter.

The fact that oxygen gas passes through india-rubber, but less rapidly than the nitrogen, does not seem to be generally known. Attempts have been made to obtain, by this method, air rich in oxygen available for practical purposes, but as yet it has not been done to commercial advantage. In relation to this passage of oxygen through india-rubber, Mr. Wright states:—

Gas should never be kept in a bag any length of time. Oxygen acts rapidly upon the material; but independently of this, no gas can remain pure, owing to that wonderful process of diffusion through the material which physicists call *osmosis*. A bag filled with perfectly pure oxygen will contain a portion of air in some hours' time, and any bag tight in the morning is perceptibly slackened by night. Supposing gas to be left over one night, to any amount, there is no reason, if convenient, why it should not be kept, and merely filled up for *the next* night; but beyond this gas should never be kept, or the light will be perceptibly affected.

If in photographic research the experimenter could get coloured glasses to give all the more pronounced colours of the spectrum quite pure, such a set of glasses would be extremely useful, and the author of the book under notice says that Mr. Madan has discovered that, by superposing Chance's signal green on a rich cobalt blue glass, the two only transmit rays between F and G. This, therefore, is the way to obtain a true blue by means of flat glass plates, and is an interesting fact worth notice.

The work contains useful practical information about lime-light jets, photo-micrographic instruments, and the application of the magic lantern to purposes of scientific demonstration. The book contains practically nothing about the history of the magic lantern. Those interested in the latter branch of the subject will find much about it scattered up and down in pages of this journal during the last five or six years.

Taking Mr. Wright's book altogether, it is about the best we have seen on the subject, but is defective in not going into sufficient detail about the optical system of the lantern, the relative merits of various condensers, and the focal lengths and other points about the lenses of which they are composed. It also is too meagre in information about oil lamps.

## Notes.

In a partly serious and partly ironical pamphlet, Dr. Emerson has renounced what has, unfortunately, been called "naturalistic" photography, and most of the outcome and adherents thereof. At all events, the general result of his efforts has been to stir up much thought on the artistic aspects of photography, and to initiate the production of a new class of pictures, some of which were exceedingly beautiful, as acknowledged by those photographers who do not care to have their names pinned to any particular "school." Widespread public attention was early drawn to the merits for special purposes of rough-surfaced papers and broad photographic treatment by the picture of Penzance Harbour, exhibited by Col. W. L. Noverre at one of the exhibitions of the Photographic Society, and reproduced as a supplement by this journal. In Mr. Lyonel Clark's photograph of Dedham Bridge, which we reproduced at the beginning of this month, there was not a sharp line in the picture; yet the result was generally regarded by the public as pleasing.

Photography is to the front in the pantomime at the "Elephant and Castle" Theatre. The clown produces a tripod stand of special construction, and which may well be inspected by manufacturers of photographic apparatus. On this stand he places a camera, and in front thereof a policeman, seated on a chair in the street. At the moment of uncapping the lens, the clown, to rivet the attention of the sitter, points upwards and says, "See the little dickey-bird fly," when, behold, the photograph is taken by the primuline process, and drawn out at the back of the camera as the head of a jackass or nondescript animal printed upon a pocket-handkerchief. The sitter being dissatisfied, a gun camera is substituted and fired, whereupon the sitter takes to his heels smothered with flour. The unfortunate policeman, being an emblem of authority, gains no sympathy from most of the observers when he is ill-treated in a pantomime.

The General Syndicate of Photography in Paris is an organisation which deals with the commercial and other interests of photography; it has already adopted the principle of arbitration in trade disputes, in place of going to law, and has framed some rules as to the conditions under which the Syndicate will arbitrate. The Syndicate gives attention to the dealing of Custom Houses with photographic plates and goods of all kinds; it keeps a watchful eye on all legislation affecting the interests of photographers, and seeks to make itself generally useful.

Composite heliochromy, or the plan of taking three negatives of a scene through three glasses of suitable colours, and then obtaining therefrom superimposed images in suitable pigments, so as to build up mechanically a coloured representation of the original views, is said by Mr. F. E. Ives to be capable of giving fine effects in tho optical lantern. In a paper read last month before the Franklin Institute, he stated that the effects can be brought before the public in the form of optical lantern lecture illustrations, not with the triple lantern, but with transparent colour-print heliochromes mounted as lantern slides. If the colour-prints are made by the Woodburytype process, such heliochromic lantern slides, infinitely superior to hand-painted ones, can be made in quantity, he said, at a cost not exceeding one dollar each.

It is an inexorable law in matters photographic, as in other fields of work, that demand must stimulate supply, and manufacturers of photographic apparatus are so watchful of what is going forward that a suggestion is no sooner made than it seems to be acted upon. Printing on smooth paper has, to some extent, had its day, and there is just now a demand for rough-textured material. The demand has operated in the customary manner, and, after a few energetic workers had experimented with different processes for sensitising the roughest drawing-paper which they could obtain, it is now to be bought ready prepared by the Fry Manufacturing Company for photographic purposes.

The experiments in this direction have usually followed the old process of salting and sensitising by means of a nitrate bath, or perhaps a nitrate *brush.* But this new paper is prepared with gelatine emulsion, and so it comes under the head of bromide paper, a paper, however, which is far rougher than any before to be obtained. There is little doubt that photographers, by the adoption of this (Whatman's) paper, have taken a very useful leaf out of the water colour artist's book, for it is greatly due to the texture of the paper that the painter is able to get those pearly tones and effects of atmosphere upon which he so much prides himself. The photographer certainly has a much harder task before him in securing the same result, for he cannot work in colour; still, he makes a step in the right direction by borrowing a hint from the painter in water colours.

A curious problem crops up in connection with this use of sensitised rough paper, and one which it is not very easy to solve. It is this: Although rough and smooth paper may be coated from the same bottle of bromide emulsion, the former will require more than double the exposure of the latter. Why should this be so? Certainly not because of any chemical impurity or difference in the paper, for the material for water-colour work is made—generally by hand—with the most scrupulous care, so that there shall be no possible chemical reaction with the colours laid upon it. We should be rather inclined to fancy that the lowered sensitiveness in the case of rough paper must be partly due to the absorbent nature of the material —which would cause many of tho molecules to be buried—and partly to the rugose nature of the surface, which would hide many more in its crevices from the access of light.

Another application of our ubiquitous art! We learn that a firm of Nottingham curtain manufacturers employ a photographer whose business—happy man—is to seek out secluded nooks and glens, where ferns and underwood flourish, where streamlets murmur, and where the kingfisher and dragon-fly glide. He takes photographic notes of these natural pictures, and from his photographs artists work out designs for lace curtains. Up to within quite recent times, English manufacturers were dependent upon French designs for their lacework, but the camera has been introduced into the service, and Waterloo, in this case, has not yet been avenged.

---

It is satisfactory to see that the British Museum authorities are alive to the advantages of photography. Simultaneously with the announcement of the discovery of the Aristotle papyrus comes the statement that the latter is to be photographed. It is very clear that photography places a considerable power in the hands of scholars and antiquarians. By means of facsimiles, comparison can be made with specimens in foreign libraries, and thus the possibility of deception and forgery effectually guarded against.

---

It would be interesting to know how a phrenologist can give an analysis of a person's character from a photograph. It is clear that he cannot feel the bumps, though perhaps it may be argued that, by intently studying the conformation of the skull and the various elevations thereon, he may evolve something out of his inner consciousness. Anyway, Dr. Koch has been phrenologised by the *Phrenological Magazine* simply from study of his picture. As a contemporary remarks, "photographs are dangerous things from which to describe a person's phrenological properties." The writer, it seems, has overcome the difficulty by granting to Dr. Koch almost every gift and capacity extant.

---

We are not aware that photographers are addicted to photographing themselves, but possibly this may be due to the mechanical difficulties in the way. Artists have not the same trouble, and it is not surprising that most well-known artists have painted their own portraits. Indeed, a collection of portraits of painters by their own hands has been suggested as a means of elevating art, and there is already a most interesting gallery of the kind in the *Uffizzi* at Florence. Sir Frederick Leighton does not, however, favour the proposition, as he says that to paint one's own face is distasteful to the artist. We do not know why this should be so, as an artist paints from his reflection in the glass, and such a reflection, the student of human nature will say, is always one that is agreeable to the person reflected. When we look in the glass we see the image we want to see. This is why a photograph which takes us with an unfamiliar look upon our faces comes at times as such a painful surprise. We do not think that Sir Frederick Leighton is altogether correct in his opinion. Experience points to the opposite.

It may not be long before the ingenious pantomime mask-makers, in want of a new monstrosity, will go to photography for it. The photographs of insect life, exhibited by Mr. Poulton in his lecture to children at the Society of Arts, are said to show such grotesqueness and unexpected forms, that nothing so curious has ever been seen at the opening of a pantomime. This certainly gives a new field for the Dynwinkyn—whose name used to be a household word in the mask world—of the future.

---

Panama is about the worst place in the whole world for photography. We are informed by a traveller who has recently visited the Isthmus that it is absolutely impossible to buy any moderately decent photographs either of the canal works or anything else. Photographers give up the task in "despair." This is on account of the extreme humidity of the atmosphere. Some idea of this may be imagined when we say that the contents of a trunk which formed a portion of our informant's luggage, and which trunk was never opened while at Panama, were found to be incrusted with a green mould. Only those who have travelled on the Isthmus can form any idea of the hygroscopic conditions. Naturally the climate is as fatal to life as it is to photography.

---

It is sad to have to confess that photography lends itself easily to bad ends, but such is the fact. The old dodge of inviting ladies to send stamps, and in return they would have unlimited work in the way of colouring photographs, for which "no previous experience" was required, is, it is true, exploded, but a new artifice has taken its place, and would appear to be even still more remunerative. This plan consists of advertising that a generous firm will supply you with a pastel portrait on the sole condition that you have the picture nicely framed, and recommend the work of the firm to your friends. When you send your photograph, you get back an intimation that nothing can show off the "pastel portrait" so well as one of the "firm's" frames, a pattern sheet of which is enclosed. If you decline to purchase a frame, the pastel portrait never comes, nor is your photograph returned. A Shoreham solicitor who had been done in this way, bringing an action this week in the Worthing County Court, obtained judgment for two guineas—the amount demanded for the failure of the contract. As the defendants did not put in an appearance, it is more than likely the two guineas will be as invisible as themselves. The lucrative nature of this advertising dodge may be imagined from the statement by the plaintiff's solicitor that as much as £800 had been traced through the post office representing remittances sent in in one day to the firm in question.

---

A storekeeper at Barberton has a queer advertisement in the *Barberton Herald*. After going through the list of his goods, he says, "Photographers wanted to take display for next Transvaal Exhibition. No amateurs need apply." Why this contempt for amateurs?

## PHOTOGRAPHY IN ANILINE COLOURS.*

BY A. G. GREEN, C. F. CROSS, AND E. J. BEVAN.

In the diazotype process, which is the main subject of this paper, we have as the actual photographic agent not only a highly-sensitive compound—highly sensitive, that is, to the action of light—but one which can be readily converted into a variety of colouring matters. The process consists of three stages :—(1) Drying or coating the surface upon which it is required to photograph with a particular compound, which is theu (2) converted into a photo-sensitive derivative ; and (3) exposed to the light under the usual conditions for giving the picture ; (4) converting the seusitive compound, wherever it survives, through having been protected by the shadows of the object photographed, into colouring matters, and thus the picture is developed from the weakly coloured sensitive compound into well-marked shades of red, orange, brown, purple, or blue ; and these shades being formed in stable colouring matters, the picture is at the same time fixed.

For the better understanding of the process, it is necessary that we should acquaint ourselves with the properties of these substances, apart from any reference to photographic action.

The compound we start with is a yellow-coloured body, to which the " trivial " name of primuline has been giveu. This compouud is obtained by the actiou of sulphur upon toluidiue, a coal-tar base closely allied to aniline. In this action uot only is there combinatiou with sulphur, but several molecules of the toluidine are built up into one complex molecule.

Then, to express the matter in our modern formulæ, we start with $C_6H_5\ Cu_8\ NH_2$ toluidine, and obtain—

$$CH_3.C_5H_3<{}^{S}_{N}>C.\quad C_6H_3<{}^{S}_{N}>C.\quad C_6H_3<{}^{S}_{N}>C.\quad C_6H_4Nu_2$$

primuliue base—a very formidable looking compound. Now, the important part of this formula to us is uot the uuwieldy body, but the head, the small group $NH_2$. We can consider primuline in its simplified form $X.NH_2$, and we see that this differs from ammonia, $H.NH_2$, in having one H replaced by a complete group. Correspouding to this general resemblance, there is a similarity in their distinguishing property ; both are basic or alkaline substances, and combine with all acids to form salts. One only of these we have to consider, that very combination with which the stable primuline—highly resistant to all agencies which destroy the more fugitive colouring matters—is converted iuto a photo-sensitive derivative. This acid is nitrous acid, $HNO_2$. Nitrous acid and ammonia combine to form ammouium tritrite. Wheu this tritrite is heated, it is resolved spontaueously into nitrogen gas—the inert constituent of atmospheric air - and water.

Primuline, in common with all coal-tar bases, combines with nitrous acid to form a species of nitrite, which is termed a diazo compound. All that we need note abont these diazo compounds is that they correspond to the intermediate stage in the transition of the ammonium nitrate to the condition of nitrogen (and water) thus :—

| | | |
|---|---|---|
| $NH_3.\ HNO_2$ | $H.\ N\ N\ OH$ | $N_2$ |
| Ammoniuu nitrite. | $(-H_2O)$ | $(-2H_2O)$ |
| | $X.\ N = N.OH$ | |
| | Diazo-primuliue. | |

These diazo derivatives are, as a class, sensitive to light undergoing decomposition with evolution of nitrogen gas. But what concerns us, for the moment, is their avidity for construction or syuthetic reaction with two large groups of coal for compounds—the bases and phenols. With these they combine very much as the original bases combiue with nitrous acid, to form these active diazo compounds, and the products are the azo-colouring matters. We cite the more importaut of these, obtained from primuline. In the case of the several phenols, their alkaline solutious are employed, while in the case of the bases aud solutions are used—

*Primuline* and nitrous acid gives *Diazo-primuline.*

| | | | | | |
|---|---|---|---|---|---|
| β Naphthol. | Pheuol. | Resorcin. | Pyrogallol. | α Naphthylamine. Hydrochlorinde. | Amido. β Naphthol. Sulphuric Acid. |
| *Red.* | *Yellow.* | *Orange.* | *Brown.* | *Purple.* | *Blue.* |

These relations we demoustrate with diazo-primuline and the several reagents above-mentioned.

We now come to the photographic applicatiou of these reactions. The essential conditiou of primuline photography is—(1) that these reactions take place with primuline after its applicatiou to any surface or material, such as wool or silk, as a dye, without in the least affectiug its union with the material ; and (2) that the diazo-derivative produced, in combination with these materials, by treatiug the primuline-dyed surface with nitrous acid, is photo-sensitive in the highest degree, far more so, in fact, than the derivative itself, when free or uncombined.

Having thus prepared the way, we proceed to a complete experimental demonstration of the process. We first show the building up of the colouring matters upou the cotton and silk fabrics, showing that the reactions take place in silk without disturbing the union between the colouring matter aud fabric ; and that the azo colouring matters so built up withstand the action of boiling soap.

We have now to demonstrate the sensitiveness to light of a surface dyed with primuline, and sensitised by treatment with nitrous acid, and we shall show that the actiou of the light is to destroy the diazo-derivative, that this destruction is due to the splitting off of its two characteristic nitrogen atoms in the gaseous form. We are enabled to show this to au audieuce owing to the curious fact that, iu a gelatine medium, the nitrogen, though liberated from combination, is not evolved until the gelatine is softened by contact with water. We expose a primuline-gelatine plate to photographic action, and on plunging into a transparent bath of water, an image of which is thrown on the screen, we see the form of the print instantly developed in minute bubbles of gas. On then treating the plate with one of our developers, we see that when the gas has formed—the evidence, *i.e.*, of the destruction of the diazo-primuline—then no development of colour takes place.

We now develop a number of prints which have been exposed in the daylight, and brought here in the conditiou in which they left the priuting frame. In these developed pictures the high lights are represented by the ueutral tint—varying from buff to cream—of the product of destruction of the diazo derivative, the absence of development in these portions being due to the chemical mixtures of this product.

The development of colours correspondiug to the shadows and half tones of the object is exactly proportionate to their depth, to the degree of protective action which they have exerted on the sensitive surface beneath—iu other words, to the quantity of diazo-primuliue which survives.

Revertiug to the considerations which we advanced in the earlier portion of this paper, we should explain the action of the light on an addition of euergy or atomic motion to the molecule of the diazo-primuline, whereby the split or cleavage of the molecule at the point occupied by the two nitrogeu atoms is determined, just as by adding heat to ammonium nitrite its molecule is resolved into nitrogen, and a residue, which iu this case is not a complex compouud, but water.

We have already alluded to the fact that the rays which attack the diazo-primuline are by no means confiued to the blue and violet constituents of the spectrum, but extend well through the yellow to the orange red. In other words, a primuline print is more nearly a measure of the visual intensity of the sun's rays than the sensitive substances used in the ordinary methods of photography, in relation to which it is well known that the photographic intensity of sunlight is a very different thing from visual intensity, owing to the enor-

* A paper read last Wednesday night before the Society of Arts, with Capt. W. de W. Abney in the chair. We omit the preamble.

mously greater activity of the blue and violet rays—*i.e.*, those of least visual intensity—in decomposing the compounds which they employ.

It will be convenient here to point out another contrast of this method with those more commonly employed. The prints obtained with it are positives, the light and shadow in the object being exactly produced in the coloured picture. Natural objects, therefore, of convenient form, such as leaves, may be photographed directly; reproductions from camera pictures require glass positives, or positive paper prints made transparent in the usual way with vaseline.

In view, perhaps, of the chemistry of the method, it would perhaps be more correctly termed a negative method, since the action of the light is destructive, and when it acts, the construction or development of the colour is rendered impossible. In the ordinary methods, on the other hand, the light is an agent, as it were, in the synthesis of colour—when there is most action the deepest tones are developed—and the photographic action would, in this case, perhaps, be more correctly termed positive. The point, however, is not a very important one.

There now remains to be noticed a second photographic process, based upon the peculiar properties of the diazo-derivatives of the coal-tar bases; a method which, to use the ordinary term, is a negative one, *i.e.*, the light plays a constructive part in the development of a coloured picture.

When the diazo compounds are treated with an alkaline bisulphite, they are converted into the diazo sulphonates. These compounds are sensitive to light, the action of which is to set free the diazo group from its combination, but they do not react with phenols and amines, as do the diazo compounds. The mixture of a diazo sulphonate with the latter is unattended by any colour reaction, but, on exposure to light, the diazo group being set free in presence of a phenol, the development of an azo-colour takes place *pari passu*. This reaction is the basis of the process invented and patented by A. Feer. The photographic surface is a mixture of a diazo sulphonate with the alkali compound of a phenol applied to any suitable material. On exposure to light under a transparency, development of colour takes place in proportion to the quantity of light transmitted, giving, therefore, a reversed reproduction, or negative picture. When printed, the unattacked mixture is dissolved away by copious washing, leaving the picture, already developed in the azo-colour, permanently fixed upon the fabric or material.

This process is not rapid enough to admit of being conveniently demonstrated by means of the artificial light at our disposal. We must, therefore, content ourselves with this brief description, referring those who wish for further information to the specification of the original German patent, No. 53,455/ga.

In concluding our brief sketch of this new departure in the application of the coal-tar colours, we need not, perhaps, apologise for its brevity. We learn that our friend, Professor Meldola, is to give a course of Cantor Lectures on "Photographic Methods;" and his survey of the field will be wide and complete. We have not attempted to give a general account of photographic methods partly on this account, and partly, also, because these diazotype processes are entirely typical of all printing processes, and, as subjects of lecture or educational demonstration, have the great advantage of involving the very simplest reaction possible; whereas, the changes which take place in silver compounds are very complicated, and as yet but imperfectly understood.

The primuline process is simplicity itself. It can be practised with the minimum of apparatus, and requires no technical training. The results are striking and pleasing, as we hope we have been able to show.

At the close of the reading of the foregoing paper a few questions were asked.

Mr. T. R. Dallmeyer asked if the authors knew the spectral qualities of the colours obtained by the process with a gelatine vehicle, and whether the qualities were equal to those obtainable by means of manufactured glass.

Mr. Leon Warnerke wished to know whether the authors had, so far, been able to get rid of the yellow ground to the prints.

Mr. Cross, in reply to these and other questions, said that he would leave the question of the spectral values of the colours obtained to Captain Abney. When primuline is used the yellow ground cannot at present be avoided, but the whole subject is new; with other dyes of the class the authors have obtained a nearly colourless ground. The applications of the primuline process are general, and the results obtained will resist the action of hot soap and water; they are also exceedingly fast to light.

Captain Abney, the Chairman, stated that Mr. Bevan had been at his laboratory experimenting upon the absorption spectrum of the sensitive compound, and could give all the particulars. The absorption extends over nearly the whole spectrum, but fades off between the yellow and the red. He (the speaker) had worked the process to a limited degree, and had become quite fascinated by it; he thought that it would become a perpetual source of amusement in the decoration of houses. Everyone knew how ladies bought pictures to stick them to glass, spending much time over such work; but by means of the process just demonstrated they could decorate their furniture and their homes, and go to nature for their subjects. The materials were simple, and he thought that he was right in saying that they were harmless; they also can be contained in a few beakers; the only other adjunct required was a common photographic printing frame; obtaining natural objects from the garden to photograph was then all that was necessary. He had to thank the authors for their interesting process. Not every day is it that we get a thoroughly new photographic process, and this was thoroughly novel; at least, he had never heard of anything of the kind until about six months ago. Unfortunately, the sensitiveness of the compound is not great enough for the camera, but there is no knowing what may happen in such matters.

---

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Subject for January 29th, "Photo-Micrography."

LORD RAYLEIGH will lecture to-night at the Royal Institution on "Some Applications of Photography," and in the library some objects of photographic interest will be exhibited, including some "pigeon-post films."

PROCESS FOR DETECTING WOOD-PAPER.—M. Wurster.—The following reagents serve to distinguish wood-paper from pure cellulose:—

| Reagent. | Wood-paper. | Cellulose. |
|---|---|---|
| Orcine... | Dark red ... | Nothing |
| Resorcine ... | Deep green... | Violet |
| Pyrogallic acid | Blue-green... | " |
| Phenol ... | Yellow-green | " |
| Phloroglucine | Blue-Violet | Nothing |

The presence of wood in paper can be detected, and the quantity even estimated, by means of dimethyl paraphenylendiamine.—*Journal de Pharmacie et de Chimie.*

RECOVERY OF URANIUM RESIDUES.—For the recovery of uranium residues, Lambe (according to the *Zeit Angewandte Chemie*) recommends the following modification of the Reichardt process:—"The residues from titrations are collected together, and the clear liquid is decanted off from time to time. When a sufficient quantity has been collected, the pasty mass is either heated in the pot by introducing steam, or in an iron pan over an open fire. Soda crystals are then added until the precipitate appears chiefly dissolved. It is let cool, mixed with a sufficiency of ammonia, and the phosphoric acid is precipitated with magnesia mixture. After standing for twelve hours the supernatant liquid is syphoned off, and the precipitate is washed with ammoniacal water. The alkalide liquids are neutralised either with hydrochloric or sulphuric acid, heated to expel carbonic acid, and the uranium is precipitated at a boiling heat with ammonia as uranium oxide ammonium. The precipitate is washed by decantation. A small quantity of some ammonium salt must be added to the last washing waters, as the precipitate otherwise does not settle well. For obtaining uranium nitrate, the precipate is dissolved in excess of nitric acid and concentrated by evaporation."

## DEVELOPMENT.*

BY J. K. TULLOCH, M.B.

THE question of development is a very wide one, and, in fact, the compounding of a developer is the very simplest part of the whole. It is not to be denied that even in the purely chemical part there is a wide field for interesting experiment, and I have whiled away many an hour contrasting soda with potash, and this, again, with ammonia. There is room and need for such work; but I say it is not enough to confine one's attention solely to this aspect of the question, and it is my intention to-night, while not neglecting this side, to dwell also upon other considerations that are, unfortunately, too often lost sight of. In this way the subject comes naturally to be divided into two heads: first, what do we wish to develop? and, secondly, how and by what special means are we to attain development?

First, then, what do we wish to develop? This seems almost a nonsensical question; we wish to develop a picture, of course. This is undoubtedly so, but all pictures are not alike, and here steps in a very common error. It is assumed by almost everyone that perfect development means getting the last particle of detail out with pluck and roundness of image. This is not always the object of the true photographic artist. Scarcely in two pictures does he aim at the same amount of light and shade or of detail. If he has thought out the effect he wishes to produce, he must be prepared to sacrifice detail sometimes, or pluck, or even roundness. Every effect should not be the same, or his results, however perfect from a photographic point of view, will be tame and often inartistic. In looking over the works of a friend not long ago, he whipped a picture from my hand, saying that he had taken the plate from the developer before the detail was out on a distant hill, but that he had taken it again; here it was. On comparing the two, there could be no doubt that the first effect was immeasurably the better, but you must all have seen in your own experience how sometimes absolutely *bad* photography (from one point of view) gave, accidentally, effects you might have striven in vain for intentionally, unless you recognise upon what the artistic success of a picture depends. I saw in the hands of a beginner the other day a splendid view of the river with a dark, lowering outline of the Tay Bridge. He was in great grief over his failure, having, as he thought, either under-exposed or under-developed, or played havoc otherwise with it. I make bold to say he will not make a picture like it again for years. But not to lose sight of the point, I wish to insist upon it that grand effects may be produced, showing the utmost variety of light and shade, detail, and every other photographic quality, which is (according to some) always a fixed amount—namely, as much as you can get into every plate. Suppose, for instance, that the painter was to get such an absurd notion into his head; he would be obliged often to put in detail into his shadows, when, in point of fact, his eye had seen none. Yet this is just what a great many photographic men do. They pick up a photographic picture, and, after generously allowing its great artistic merit, will sagely add: "Pity there had not been a little more detail in the shadows," oblivious of the fact that this may be the very reason of its artistic excellence. There is no standard quality of detail—or light and shade either, for that matter—and it certainly is very absurd to count the success of a photograph by reference to such quality as the amount of detail in the shadows, or any other part of the picture.

If a picture is an artistic success, this is enough, without a moment's consideration of it from either an optical or chemical point of view. Yet almost the one point spoken of in relation to developers is this power of giving detail in the shadows, as if this were a *sine qua non* in every photographic experiment. I quite grant that a man may desire to produce a picture free of detail in the shadows, or all over even; but this is a very different thing from insisting that every successful photograph shall be crowded with detail, and that successful development always means this and nothing else. This is a huge point in my estimation—to grasp the fact that successful development *may* mean anything, from almost clear glass to very near opacity, and that whatever method be adopted, results as widely different as these shall be within the power of the operator.

I think it almost a necessity to adopt artificial light in the dark room. How is it possible to hit the thing to a nicety when the sun may be streaming in upon your dark room window the one moment, and scarcely light enough to see the dish the next? If it is not an utter impossibility, it is at least a needless difficulty. I have a small gas lamp enclosed in white glass, covered with yellow paper. I have the same light every time, for I have what they call a rat-tail flame, which I turn up till it touches a wire exactly two and a-half inches above the burner. This is a very constant power of light, and adds much to the ease and certainty of judging the density. But I have another aid, and as this introduces other considerations, I must seem for the moment to go off at a tangent.

It must have occurred to you that it is an unfortunate thing that the production of detail and the acquiring of density are processes going on at the same time, but not much dependent the one upon the other. Sometimes, when the exact amount of detail desired is just there, the plate will be too thin, and to get it thicker one has to develop on with a certainty of losing the effect he had aimed at. At other times the plate will be quite opaque in parts before enough detail has had time to come up. In order to be master of the situation, and have an easy mind, one must be able to say he will have more detail but no more density, or *vice versa*, just as he thinks fit. And so he can, but not by the ordinary method; he must separate the two processes. He must first develop a thin image with just that detail he wants, and secondly, he must add to its density afterwards.

Of course this is nothing new; it has been proposed often, but somehow people seem to prefer to stumble on in the bad old way rather than be troubled to learn a newer and better method. Since I have adopted this plan, photography has new charms for me. I am not now a creature of circumstances, but feel that if a picture is not up to the mark, it is my ideal that is at fault, not a mere accident of manipulation. This is an immense gain. And now to revert a moment to where we were. Do you see that, while developing this *thin* image, the plate is always beautifully transparent, and by looking through it to a light of constant strength, one soon learns enough to make the process a certainty as to the amount of detail.

I may say that I do not attach any very great importance to the compounding of a developer. When soda was first introduced I tried it very critically, and got it

* Abridgment of a paper read before the Dundee and East of Scotland Photographic Association.

into my head that there was something very particularly fine in the working of it. I imagined that a soda-developed negative gave a better range of tones and all what not. The lapse of time, however, brought calm reflection, and then I had to admit that, however pleasant to work, my ammonia-developed pictures were every whit as good. The same thing happened with potash. I read all I could about this alkali, and had potash on the brain for a certain time. The negatives which I got with potash and sulphite of soda were some of them exquisitely beautiful, but as printers they turned out failures.

*(To be continued.)*

## NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. III.

Photography has been called every man's business. In the past the art has been a too facile refuge for those who have failed in other walks in life. The brewer, and baker, and candlestick maker have found it an easier means of a narrow existence than the practice of the mechanical trades to which they had been brought up, and filled the spaces which would have been better occupied—for the credit of the art—by those who were properly educated for it. It may be said of photographers as Byron said of critics :—

> "A man must serve his time to ev'ry trade
> Save censure—critics all are ready-made."

But this state of things is improving, and the best places in the business of photography are being gradually filled up by those who have been properly educated and trained to it, just as other businesses are led up to by apprenticeship or articled pupilage ; and to attempt to open a studio now without some such training would be to undertake a great responsibility.

What, then, should be the qualification of a first-rate portrait photographer? Is it a knowledge of chemistry, optics, carpentry? Certainly not. The first consideration is that he should be an educated gentleman. Not that he need be educated according to the much-abused conventional or scholastic meaning of the word, which can only see education at the Universities. What is wanted is correct language, easy manners, quick perception and insight into human nature.

To this must be added the ordinary knowledge which every educated person should possess, added to what might be called newspaper information, for daily use. He should be all things to all men, and ready to discourse with at least plausible knowledge on all ordinary subjects, and if he could make himself acquainted with a few erudite studies, or have a hobby of some scientific, naturalistic, or archæological character, it would be to his advantage. General education, then, should be the foundation on which our future superstructure should rest. Without it, or with only a little of it, our photographer may be a good photographer, and able to take a portrait technically excellent, but it would be by a rare chance if it were the best that could be done of the sitter, and in all arts and sciences—and, indeed, in all relations of life—it is better to eliminate chance, yet at the same time being ready to take advantage of any happy opportunity that may occur. The Duke of Wellington said it was the general who made the fewest mistakes who won the battle. Of course there are positions in photography where the best is not called for, or expected, but I am now speaking of the aspirant to the highest position.

The next qualification is a knowledge of art. Not merely the shallow acquaintance with it that is to be got from a few lessons in a drawing class or an art school—which, however, would be the best beginning—but the wider knowledge that embraces the history of art and a study of all the schools, from Cimabue down to the many varieties of the present time. Some of these latter are at least remarkable for their enthusiasm.

But this as a digression. Art should grow up with other knowledge ; the first dawn of it cannot come too early. It is difficult for a man who has not cared for it the first half of his life to say, "Now I will begin to study art, to be enthusiastic about it, to teach it." I only know of one instance in which great art came to a man in his mature years without previous study, and that man was Claude Gelleé, of Lorraine. To take an exception from our own art, Mrs. Cameron did not take up photography until late in life, and this she did without any training for art of any kind. Her portraits were full of artistic feeling, but as works of art and photography they were very immature. They were full of promise, but lacked fulfilment, although of late they have been lauded to the skies. Before her death she saw the defects of her earlier work, and was advancing to more photographic completeness.

The photographic press of the time has been recently ignorantly accused of a "vulgar outcry" against Mrs. Cameron's pictures. To say that her pictures were full of faults did not imply that there was no merit in them. The *artistic* merit was always recognised ; it was the *photographic* defects that were condemned by the photographic press, not more so, however, than they would be at the present time, even by those who now virtuously profess to wonder "how critics should have existed to shower abuse" on these photographs. It was the ignorance of those outside critics who professed to admire these very unequal productions, *because of their faults*, that was chiefly ridiculed. There is an effect of superior knowledge and cleverness in finding beauties where they do not exist, or are not visible to others, that is irresistible to some critics, and it is not a new discovery. Sir Joshua Reynolds noticed it in his time, if we may judge from the following passage in his discourses: "So far, indeed, is the presence of genius from implying an absence of faults, that they are considered by many as its inseparable companions. Some go such lengths as to take indication from them, and not only excuse faults on account of genius, but presume genius from the existence of certain faults."

To return more directly to our subject, the future photographer, prepared as I have indicated, is now ready to study photography for professional purposes.

There can be no doubt that a course of elementary chemistry would be of the greatest use to the budding portraitist, but it should be confined to the elements. I remain convinced, as I always have been convinced, that too much science is inimical to art.

There are, of course, some minds great enough to hold the two, but the hard fact of science is apt to clash with the only half-understood feeling of art. There is a good deal that an artist does that he knows is right but cannot easily explain, and any attempt to put it under the microscope and analyse it scientifically soon makes prose of the poetry, and an exhaustive study of exact science is apt to engender a turn for that analysis which is opposed to feeling. There is a good deal of fine poetry which the world enjoys that would not stand the test of the grammarian's scrutiny, and much artistic romance that would not bear the touch of the Ithuriel's spear of a scientific Mark Twain. I must not carry this argument too far, or it would be made into an excuse for not learning anything —there is always danger in extremes—and I may lay myself open to be misunderstood. I have a great reverence for science, but think that the artist should take just as much as would be good for him, and no more.*

I know that this is not the opinion of those who usually decide upon what a photographer must learn, and that a student can get a certificate that he knows all about photography when he knows the complete chemistry of the operation short of the composition of the image; and, indeed, in strict technical truth, so he does, but he has only learned the technical application of his materials, and has yet to know how to put them to artistic use in the making of pictures, and the mischief is that when students go for the advanced science of photography they sometimes get lost in it, and the result is that it often happens that learned chemical papers are read against each other by great scientists at photographic societies to prove or disprove a simple fact that a mere tyro could easily settle by a couple of experiments.

It is pleasant to see that there is at last to be some addition made to the usual chemical course at at least one great teaching centre, and that the managers of the Polytechnic Institution are about to add lectures on art as applied to photography to their programme. It is to be hoped that if a great photographic institute should ever be founded, that it should not be a mere chemical laboratory, but that students should be taught to put the art to use. Abstract science must be held in all respect, but the average photographer is a practical man, and wants to know how to make pictures.

The Photographic Club.—On Jan. 28th the annual lantern and musical entertainment will take place; subject for Feb. 4th, "The Tone of Lantern Slides."

The Croydon Microscopical Society (Photographic Section)—January 16th was a lantern night, when a good selection of over 200 slides, by members, were passed through the lantern during the evening. The next ordinary meeting will take place on the 6th, and lantern night on February 20th.

Last Saturday the employés and friends of Messrs. Percy Lund and Co. met in the Teetotal Hall, Bower Street, Bradford, Yorkshire, for their annual winter social evening. Proceedings commenced with a tea, to which over seventy persons sat down, and after the tables had been cleared, an excellent variety programme was gone through. As a number of the employés are young people in their "teens," a departure from the usual rule at such gatherings was made by introducing a few old-fashioned games, such as blind man's buff. The platform items of the programme included a couple of dramatic sketches, a short comedietta, and a variety of vocal and instrumental music, and recitations.

* This paragraph was written some weeks ago, and I cannot help referring to a singular illustration of its truth which has just occurred, and will probably be announced to-day. A study of Messrs. Hurter and Driffield's scientific papers, aided by a few minor considerations, has so convinced Dr. Emerson that true values cannot be obtained by photography that, with a courage worthy of all praise, and which I, his old opponent, respect, he has renounced "Naturalistic Photography," proclaimed its death, and written its epitaph. The throwing up of a cherished belief which has occupied the thoughts of many of the best years of a studious life, through scientific conviction, is a heroic proceeding, which, while it commands our admiration, makes one almost thankful for ignorance, and for freedom from the nightmares of science.

## PHOTO-ELECTRICITY AT THE PHYSICAL SOCIETY.

At the Physical Society on December 12th, 1890, with Professor W. E. Ayrton, president, in the chair—

Mr. Shelford Bidwell, F.R.S., showed some experiments with selenium cells. The crystalline variety of selenium was, he said, most interesting to physicists, owing to its electrical resistance being greatly diminished by light. This property was shown experimentally with different forms of cells, the construction of which was explained. The form recommended was that in which two copper wires are wound near each other round a slip of mica, and the spaces between the wires filled with selenium. The wires form the terminals of the so-called "cell," which, before being used, is annealed for several hours at a temperature above 200° C. Many such cells were made in 1880, 1881, and their sensitiveness to light remained unimpaired during 1882. In 1885, however, several were found less sensitive, and others totally useless; only one out of thirteen retained its sensibility till September, 1890. The loss of sensitiveness Mr. Bidwell believes due to an excessive amount of selenide of copper being formed, for, although some selenide is essential to the satisfactory working of the cell, too much is fatal to its action. The selenide of one defective cell was electrolyzed, red tufts of amorphous selenium appearing on the anodes. A white substance, resembling moist calcium chloride, was also present: this he believed to be oxide or hydroxide of selenium. Small polarisation currents had been obtained from selenium cells. A lecture apparatus illustrating the properties of selenium cells was exhibited. It consisted of a cell connected in series with a relay and a battery. The relay was arranged so that it might either ring a bell, or light an incandescent lamp. When the bell was joined up, it remained silent as long as the selenium cell was illuminated, but on screening the cell the bell rang. By using various coloured glasses as screens, the effect was shown to be due to the red and yellow rays. A similar experiment with the glow lamp was very striking, for on turning down the gas-lamp illuminating the cell, the electric lamp lighted, and was extinguished on turning up the gas. This demonstrated the possibility of an automatic lamp-lighter, which would light or put out lamps according as they are required or superfluous. Amongst the other practical applications suggested were, announcing the accidental extinction of railway-signal lamps or ships' lights, and the protection of safes and strong rooms.

Prof. Minchin said that he had lately constructed cells of a different kind from those shown by Mr. Bidwell, and found that they gave an E.M.F. when exposed to light. For his purposes the long annealings were quite unnecessary, and a complete cell could be made in ten minutes. One of his cells gave an E.M.F. of over 0·25 volt as measured by an electrometer, by the light of a fog. Their promptness of action falls off in a day or two, but if they are kept on open circuit, a week has no effect on the final E.M.F. On closed circuit, however, they deteriorate.

Prof. S. U. Pickering said that both oxides of selenium were deliquescent, and the author's conclusion as to the white substance formed by electrolysis was probably correct.

Prof. S. P. Thompson believed Prof. Graham Bell had tried platinum instead of copper, and found that the selenium cracked off in annealing. He had also found that it was only necessary to carry on the annealing until the characteristic slate colour appeared. Mr. Bidwell's experiments, he said, showed the possibility of seeing at a distance, and had also suggested to him that the effect of screening might be utilised for driving a completely detached pendulum electrically.

Prof. Forbes said that silver sulphide, when electrolyzed, presented appearances resembling those noticed by Mr. Bidwell in copper selenide.

In reply to questions from the President and Prof. Perry, as to whether the low resistance and unsensitiveness of old cells was due to moisture, Mr. Bidwell said that drying them had no effect; baking restored the resistance but not their sensitiveness. Speaking of the effect of annealing cells, he said this reduced their resistance considerably. Prof. Graham Bell, he believed, gave up using platinum because the resistances of such cells were very high.—*Nature.*

## THE VENTNOR AND BONCHURCH PHOTOGRAPHIC EXHIBITION, ISLE-OF-WIGHT.

This event takes place during this week, and is under the presidency of Sir Monier Monier Williams, and a local committee of seven members, with Col. R. V. Malden—an experienced amateur photographer—as their chairman, and Mr. Wm. Hoskin secretary. The three judges are Messrs. T. M. Brownrigg, of Guildford, J. Fielder (Messrs. Russell and Sons, Chichester), and Dr. Lord, of Wilton Street, Southsea. It is held in the reading room of the Literary and Scientific Institution, and though the room is not very large, it is by no means overcrowded with the two hundred and eighty-seven frames of exhibits upon the walls and screens. As might have been expected, the space is largely occupied with the performances of the local artists, for whom, however, the judges have no partiality, as the awards plainly show, and in the opinion of many, three at least of the Isle-of-Wight exhibitors should have had some distinction granted.

As usual, Messrs. Byrne, of Richmond, make an extensive display, and take a bronze medal for 20 by 16 direct studies. Mr. Shapoor N. Bhedwar, a Hindoo of Redhill, Surrey, has taken a silver medal for portraits, Nos. 87, 88, and 89, studies of heads very nicely posed, and quiet in tone, and it is noticeable that low tones and grey colours in matt surfaces seem to gain the preference over silver prints and brilliant effects and sharpness anywhere, which latter seem to be held in abhorrence by the modern exhibition judge on principle.

Messrs. Window & Grove, for four excellent portrait studies in carbon, take the silver medal for the set No. 11.

Mr. J. P. Gibson, of Hexham, sends a set of three views (Nos. 44, 45, and 46) very nice, well-composed pieces of scenery printed in platinum; silver medal.

Messrs. G. West & Sons, of Southsea, take the silver medal for an enlargement of the yacht *Mohawk*, apparently in bromide, and untouched. Also the bronze medal for a set of three direct yacht studies (Nos. 65, 66, and 67), "Outward Bound," and yachts *Tarana* and *Melissa*, in their usual brilliant style, full of energy and life, making you almost hear the wind and smell the sea. They also take a silver medal for a set of six transparencies of marine studies.

Mr. Cecil V. Shadbolt also takes a silver medal for a set of six transparencies (No. 252), views in the Holy Land, and representing scenes full of scriptural interest, and familiar to most Sunday school children.

For his set of "The Tor Bay Regatta," Mr. W. D. Welford takes a bronze medal; Mr. C. V. Shadbolt one also for six views in Spain. The cold tones produced by hydrokinone development have prevailed in these transparencies, but for the lantern many subjects are better suited by the warm, rich, purple brown to be obtained with Brookes' or other chloride emulsions.

We were much pleased with No. 257, a set of twenty-five views in the Engadine by Mr. P. H. Fincham, very well chosen points of view, and showing remarkably fine detail in the distances; a point of importance where Alpine scenery is concerned, and no less valuable than difficult to secure consistently with full detail in the shadows of near objects.

A handkerchief sachel and some wall pockets were embellished with prints on white silk by Mrs. S. F. Clarke, but the subjects were not very striking, and the prints rather disappointing.

Mr. Karl Greger, of Islington, takes a silver medal for three exhibits on Obernetter paper, Nos. 196, 197, and 198, all pretty rural scenes—of which "Gathering in the Homestead" is perhaps the best—and bronze medal for set of three views. Mr. A. R. Dresser takes two silver medals, one for Nos. 130, 131, 132, pictures of stormy weather at Bognor, and in the "Zuyder Zee." His instantaneous exhibits are good; he claims to use the very great speed of the 250th of a second; if a shutter to work actually at such a speed is upon the market, probably it will meet with a large sale.

Mr. J. E. Austen, of Maidstone, sends a good set of varied landscape work and marine pieces, for which he scores a bronze medal.

Mr. A. Hendry, of Huntingdon, bronze medal for a set of nine views. "A Day in the Fog;" snow scenes, in which there is so much atmospheric effect that a brilliant one or two would be a relief. They are, however, artistic, and possess much charm.

Dr. T. H. Morton, for three interiors of Lincoln and Durham Cathedrals, bronze medal.

Mr. John Catto (Nos. 188 and 190), "Three Studies of Dogs," bronze medal.

Miss S. Ballard (Nos. 203-5) for subjects entitled "Contemplation," "The Milkmaid," and "Roses," bronze medal.

Mr. H. Everitt, for three sets of landscapes, silver medal; and Miss Ada Scott, set of nine landscapes, bronze medal. Meritorious work.

Mrs. Clarke, prize for her "Queen of Hearts."

Mr. Alfred Stieglitz (Nos. 79, 80, and 81), bronze medal.

Mr. Stanley Hurst, bronze medal for a bromide enlargement of a child, untouched, in which we saw nothing but technical qualities to recommend it.

Mr. J. W. Evans, bronze medal for an enlargement (No. 159).

Mr. E. Court Cole, of Oxford, silver medal for his interiors—Reredos, New College Chapel, Oxford, and Queen's College Library—in Blanchard's platinum process.

Mr. W. D. Groundsell (No. 118), second prize, for seven views of Shanklin; nicely chosen subjects.

Space fails us to tell of those which are really good, and which have failed to obtain awards; but among them we must mention the beautiful lantern slide transparencies by Mr. James Dore, the sets of views by Mr. F. N. Broderick, the sylvan bits of landscape by Mr. J. Milman Brown; and, amongst the amateurs, the splendid sets of Indian scenes by Col. Malden (not for competition), the many pieces of Isle-of-Wight scenery by Mr. H. L. Painter, a young amateur from Bristol College, exhibits by Mr. J. G. Livesay, of Bonchurch, and many others. The catalogue is rather unsatisfactory, as it does not indicate which subjects have gained prizes, neither does it classify them distinctly, nor distinguish between the professionals and amateurs. A word to the wise is said to be sufficient, and we hope future committees will take heed to this, and make their catalogues thoroughly intelligible, and more useful for reference.

## Patent Intelligence.

### Applications for Letters Patent.

585. S. Calvert, 28, Southampton Buildings, London (Thomas Ardern, Australia), "Cameras."—January 12th.
664. W. P. Thompson, 6, Lord Street, Liverpool, "Machines for Automatically Taking, Developing, Fixing, and Delivering Photographs." (The Fisher Specialty Manufacturing Co., U.S.)—January 13th.
685. E. J. Passingham, 61, Chancery Lane, London, "Producing the Magnesium Light."—January 14th.
699. J. M. M. Munro and J. McFarlane, 154, St. Vincent Street, Glasgow, "Automatic Photographing Machines."—January 14th.
760. J. Dugdale, 7, Corridor, Bath, "A 'Lanternscope' for Viewing Lantern Slides."—January 15th.
874. A. G. Adamson, 154, St. Vincent Street, Glasgow, "Improvements in Photographing."—January 17th.
880. Victor Mathieu, 155, Fenchurch Street, London, "A Process of Photography by which, from a Single Negative, Permanent Prints are produced in the Natural Colours of all Objects."—January 17th.

## Correspondence.

### THE CAMERA CLUB CONFERENCE.

Sir,—I am requested by the Camera Club Confercuce Committee to send you the enclosed preliminary notice of the 1891 Photographic Conference, and to ask you if you would kindly draw the attention of your readers to it.

G. Davison, *Hon. Sec.*

*Camera Club, Charing Cross Road, W.C., January 19th.*

The Camera Club Photographic Conference, 1891.

The 1891 Conference will be held in the Theatre of the Society of Arts (by kind permission of the Council) on Tuesday and Wednesday, April 7th and 8th, under the presidency of Capt. W. de W. Abney, C.B., R.E., D.C.L., F.R.S.

On Monday, April 6th, at 8.30 p.m., there will be a special smoking concert at the new Club House, Charing Cross Road, and the members' annual exhibition of photographs will be opened.

On Tuesday, April 7th, at 2 p.m., the President will open the Conference at the Society of Arts, and papers will be read from 2 to 5.30 p.m. In the evening a lantern slide exhibition will be given in the Theatre of the Society of Arts, for which special tickets may be obtained.

On Wednesday, April 8th, at 2 p.m., the Conference will be renewed. At 7.30 the annual dinner for members and friends will be held.

A complete programme will be issued later and distributed. All photographers are cordially invited to attend and take part in the discussions at the Society of Arts.

### PROCESS BLOCKS.

Sir,—The question is frequently asked, "How many impressions can be printed from half-tone blocks?" We think it will interest many of your readers to learn that 155,000 good copies have been printed from the Meisenbach blocks supplied for the Christmas number of the *Lady's Pictorial*, still leaving the blocks in a perfectly satisfactory coudition, as will be seen from the sheet of specimens which we have the pleasure of enclosing herewith for your inspection. We think you will agree with us that the result is creditable alike to the engravers, printers, paper and ink makers, and shows what can be done with process blocks under fair conditions.

W. T. Dilworth, for Meisenbach Co., Limited.

*Wolfington Road, West Norwood, London, January 15th.*

[Fine specimens of work from Meisenbach blocks were enclosed with this letter; the machining of them is excellent.—Ed.]

## Proceedings of Societies.

The London and Provincial Photographic Association.

The usual weekly meeting was held on Thursday, Jan. 15th, Mr. Leon Warnerke in the chair.

The Chairman made remarks upon the forthcoming Photographic Congress to be held at Brussels in the latter part of August, and said he had been requested to call the attention of the English photographic societies to it, and to invite their co-operation. He suggested that a committee shonld be formed, and delegates appointed to represent the Association at the Congress. He then exhibited an acetate of amyl lamp, of which only three had as yet been produced. He said it was the standard unit of light fixed by the French Photographic Society, and ought to be in every photographer's possession.

Mr. W. E. Debenham suggested that a suitable oil should be used instead of acetate of amyl.

The Chairman agreed that oil might be used, and referred to Mr. Bothamley's recent article on the subject. He also said that the lamp, to prevent oxidation, should be made of pure silver.

Mr. A. Haddon, to prove his statement at a recent meeting, that sulphurous acid was sufficient to preserve pyro in solution, took 1 ounce of sulphurous acid, and made it up to 9 ounces 1 dram with distilled water, which he added to 1 ounce of pyro, thus making an exact 10 per cent. solution. The colour of the solution was a pale yellow, which, he asserted, would not change; half of it was then put in a stoppered bottle, and labelled with description and date, and placed in the cupboard of the Association, together with two solutions made up by Mr. Freshwater in the following proportions:—

| | |
|---|---|
| Sulphite of soda... ... ... ... | 4 ounces |
| Pyro ... ... ... ... ... | 1 ounce |
| Water ... ... ... ... ... | 32 ounces |

The three solutions were to be kept intact for twelve months to see what change took place.

Mr. J. B. B. Wellington had observed that in mixing pyro and sulphite in ordinary water, and then adding ammonia, it became pinkish.

Mr. A. Haddon considered that due to the use of plain water.

The Chairman said that eikonogen was a favourite developer with him; he used it in a very concentrated solution, together with caustic potash, which he believed the best alkali to use with it. Eikonogen he considered far superior to any other developer for rapid exposures, and no matter how black it became, it still had full developing power. If he wanted a very dense negative he used more eikonogen; for soft effects he diluted it with water. Bromide he used to a very little extent, and only when dealing with over-exposures.

Mr. W. E. Debenham referred to a statement in a German paper that the caustic alkalies gave more density and a brighter image.

The Chairman asked if any one had tried intensifying with eikonogen and silver.

Mr. Wellington had used silver dissolved in alkaline pyro with sulphocyanide added, and found it to work best with plates containing little gelatine in the film.

Mr. Haddon observed that he had found hydrokinone and acetic acid to develop wet plates in a satisfactory manner.

Mr. W. E. Debenham made the first preseutation of photographic literature for the new library for the use of members.

The South London Photographic Society.

*Friday, January 16th.*—Mr. F. W. Edwards in the chair.

Mr. Leon Warnerke gave a demonstration of collotype printing. Having shown how to sensitise the support, and given formulæ and instructious for drying, printing, and making ready for the press, he initiated the members into the mysteries of inking-up, and finally produced a number of capital prints. Mr. Warnerke used, and drew particular attention to, an apparatus made by the Autocopyist Co., of London Wall, E.C., specially for use by collotypists; it was an ingeniously constructed printing frame for use in an ordinary copying press, and fully equal to the work required of it.

On February 6th, the subject for consideration will be "Enlarging," to be opened by Mr S. Wiles. On February 20th will be a lantern night, when admission to non-members will be by ticket obtainable free of charge from any of the Society's officers.

### The Putney Amateur Photographic Society.

At the last meeting of this Society (January 10th) the following were elected upon the Council for 1891 :—*President*—The Hon. Baron Pollock ; *Vice-Presidents*—Mr. T. Gilbert, Rev. L. Macdona ; *Council*—Mr. Chas. Ballard (Hon. Sec.), Mr. E. V. Barrett, Mr. W. H. Congreve, Dr. J. F. Farrar, Mr. W. F. Gorin, Mr. J. C. Leman, Mr. M. S. E. Manifold.

The meetings are held fortnightly, on the second Wednesday and last Saturday in each month. Those desirous of joining should communicate with the Hon. Secretary, 46, Erpingham Road, Putney.

### The Lantern Society.

On January 12th, Mr. E. M. Nelson, F.R.M.S., dealt with the subject of "The Lantern in its Relation to Photography and the Microscope." Speaking of the fittings of a lantern, the lecturer observed that no matter what kind of jet is used, at a certain pressure it will always hiss, and this cannot possibly be avoided. As regards limes, the conventional ones with a hole through them appeared specially constructed with the view of making them easy to crack, and he advocated the use of a disc of lime, the jet playing on a point near the circumference, and the disc being revolved as it got pitted. He strongly objected to the use of many taps, as being likely to lead to confusion, and explained a simple arrangement of taps of his own. Speaking of condensers, he described various forms, pointing out that for oil lamps having a large luminant a condenser of long focus was required, also explaining that the effective diameter of the back lens was very much less than the diameter of the lens itself.

Some interesting experiments were carried out with condensers of various forms ; the best shown was a triple one which showed a remarkable superiority in the brilliancy of the picture over all the others. Speaking of the lantern in its relation to the microscope, Mr. Nelson referred to Abbe's researches with apochromatic lenses, and pointed out the superiority of the photographic lantern slide of microscopic objects over the projection microscope for exhibiting results to an audience. The lecture was illustrated with microscopic and other slides.

The discussion afterwards turned mainly on the experiments which had been shown with condensers, which appeared to have excited general interest.

### The Birkenhead Photographic Association.

Mr. George E. Thompson, on Thursday evening last, signalised his election to the presidency of the Birkenhead Photographic Association by holding a reception of members and friends in the Y.M.C.A. Institute, Grange Road. The guests invited numbered about 250 ; the greater portion of these attended, and on arrival were received in the library by Mr. and Miss Thompson. In this room the medals of the Association —gained in December last by various members—were exhibited, also a large number of effective transparencies taken by several members, and showing different views of scenery in and about Liverpool and Wirral.

Mr. Frank N. Eaton's exhibits proved him a thorough connoisseur of Wirral scenery ; some fine clouds studies, taken from the Mersey, were shown by A. F. Stanistreet ; and Mr. Paul Lange was to the fore with several wood scenes which excited general admiration. Other exhibitors were Messrs. G. E. Thompson, W. Tomkinson, Charles B. Reader, and T. W. Briggs.

Several photographic volumes were also in the room, and were inspected.

In the lecture room adjoining, two capital concerts, arranged by Dr. W. H. Hunt, were given. Lime-light demonstrations were also given concurrently in the upper and lower rooms, and were presided over respectively by Mr. G. A. Carruthers and Mr. A. F. Stanistreet. The lanternists were Mr. F. Hope Jones and Mr. J. H. Phillips, and the views exhibited showed much artistic treatment.

### The Leicester and Leicestershire Photographic Society.

*Thursday, January 15th.*—At the meeting held in the Mayor's parlour, Old Town Hall, Mr. S. S. Partridge presided. The election of officers for the ensuing year was then proceeded with, and the following was the result :—*President* —Mr. J. T. Cook ; *Vice-President* – Mr. F. G. Pierpoint ; *Committee*—Messrs. Porritt, Joliffe, Bankart, Partridge, and Weatherhead : *Treasurer*—Mr. Wilson ; *Secretary*—Mr. H. Pickering.

Mr. Wilson (Treasurer) then presented his account for the past year, showing a substantial balance.

On the proposition of Mr. S. S. Partridge, seconded by the Hon. Secretary, and carried unanimously, it was decided that the members of this Society offer their cordial sympathy to Mr. John Traill Taylor, on the loss of his wife.

*Friday, January 16th.*—An interesting and instructive evening was passed at the large room of the Co-operative Hall, under the auspices of the above Society, when Mr. E. Howard Jaques, of the Birmingham Photographic Society, came at the invitation of Mr. George Bankart to lecture before the Society on "A Trip through Western Norway." Between 300 and 400 persons were present on the occasion. Mr. Jaques gave a description of the various slides passed through the lantern, which numbered over 200, and for the greater part were accompanied with suitable and descriptive music by Mr. C. E. Birch.

### The Derby Photographic Society.

The monthly meeting of this Society was held at Smith's Restaurant on Tuesday last, when Mr. Keene occupied the chair.

Mr. Pickering, the hon. secretary of the Leicester Society, gave an interesting and instructive paper on "The Art of Emulsion-making and the Preparing of Dry Plates." He first showed by practical demonstration how the sensitive silver compounds were formed in a solution of gelatine by double decomposition, and afterwards purified and rendered of various degrees of sensibility to light by a process of ripening. Instruction for coating plates was given, and afterwards the emulsion prepared in the room was distributed amongst the members (with the formula for same) for private trial. Some excellent lantern slides made on plates coated with this emulsion were exhibited. He strongly advised amateurs to coat their own plates on account of the additional interest and pleasure it would give, also on economical grounds.

### Newcastle-on-Tyne and Northern Counties Photographic Association.

The annual meeting was held on Tuesday, the 13th, Mr. J. P. Gibson in the chair, and there was a large attendance of members. The secretary's and treasurer's reports were deferred till next month's meeting, but it is stated that the past year has been a prosperous one for the Association.

The officers elected for the current year are as follows :— *President*—A. S. Stevenson, J.P. ; *Vice-Presidents*—J. P. Gibson, H. R. Proctor ; *Treasurer*—John W. Robson ; *Secretary* —Edgar G. Lee; *Council*—M. Auty, J. Brown, J. E. Goold, T. O. Mawson, F. Park, W. Parry, H. G. Ridgway, J. H. Robinson, H. Shand, L. Williamson.

Mr. Edgar G. Lee then read a paper on "Lantern Slide Making" (in our next), in which he spoke upon the manipulation of gelatino-bromide plates, and recommended vigorous negatives and full exposures for the production of good slides.

Messrs. Lee and Brown then demonstrated the development of lantern plates, the former using Thomas' hydroquinone formula, and the latter Warnerke's eikonogen formula, diluted and restrained with bromide of potassium, two grains to the ounce. Successful slides resulted in each case.

The lantern was afterwards brought into requisition, and about 150 slides put through.

NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE first meeting of the year of this Society was held at the new rooms in Market Street. The business of the meeting consisted of a motion by Mr. R. S. ARMITAGE, seconded by Mr. J. ANDERSON, "That this Association having secured suitable rooms with a suitable approach, by which the objection entertained to the admittance of lady amateurs is removed, lady amateurs be admitted members of this Society;" and a second proposition, "That a cordial invitation be given to the Nottingham Camera Club to join the Association." Both were carried unanimously. In committee, on the motion of Mr. BURROWS, it was decided to set apart a whole week for the production of lantern slides of local views, for exchange with kindred societies. Mr. Henry Cooper was unanimously elected a member. Mrs. Richardson, St. Mary's Vicarage, and the Rev. H. Wynne Ffoulkes, were proposed as members. The official meeting having closed, Mr S. WELLS, president, took the chair at the smoking concert with which the members inaugurate the New Year.

THE GLASGOW PHOTOGRAPHIC ASSOCIATION.

*January 15th.*—Mr. WM. LANG, jun., F.C.S. in the chair.

Professor J. G. M'Kendrick, M.D., F.R.S., Arthur Robinson, David Johnston, and Matthew Edwards were elected members. A resolution expressing regret at the death of Mr. A. Schulze, F.R.M.S., and the loss the Society had sustained, was unanimously agreed to.

Mr. J. ADAMSON, jun., Rothesay, gave a practical demonstration of a method for taking instantaneous pictures indoors by means of Slingsby's magnesium flash-lamp. Two plates were successfully exposed and developed during the meeting.

A letter of Sir David Brewster's referring to the albumen process, and written in 1850, was shown to the members, and prints on Fry's naturalistic bromide paper were handed round.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

*General Meeting, 15th January.*—Dr. J. K. TULLOCH read a paper on "Development," and Mr. ANDREW STEWART one entitled "Hypnotism *versus* the Camera."*

Mr. BERRY exhibited a two-wick sciopticon which illuminated a small screen very fairly. The lantern was placed in front of and facing the audience, the screen used being a sheet of ground glass; the pictures appeared through the screen soft and bright.

THE PHOTOGRAPHIC SOCIETY.—The next monthly technical meeting will be held at the Society's rooms, 50, Great Russell Street, Bloomsbury, London, on Tuesday, January 27th, at 8 p.m.

MR. J. F. SNAPPSCHOTTE has, by request, resigned his membership of the Leopardsville Camera Club, and complains that he therefore cannot now borrow chemicals or apparatus from his former colleagues.

RECEIVED:—From Messrs. Marion and Company, Tomlinson's spotting medium, consisting of a piece of opal glass coated with the medium, so that a little can be taken off with a damp brush when required to spot prints. From the same firm a white powder, called "Berkeley's theonine," to dissolve with hypo to keep it from discolouration.——From Messrs. Fry and Company, some sheets of their new bromide paper for enlargements.——From the Publishers, 55, Chancery Lane, London, "The Photographer's Diary and Desk-Book for 1891," with a likeness of Mr. C. H. Bothamley as the frontispiece.

* These and other papers we are compelled, by pressure on our space, to hold over till our next.

# Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and or the sale of the paper, should be addressed to the Publishers of the PHOTOGRAPHIC NEWS, Messrs. Piper & Carter, 5 Furnival Street, London.

M. L. S.—*Binding of Volume XXXIV.* Not counting Mr. Lyonel Clark's "Dedham Bridge," which appeared on the 2nd inst., there were six pictorial supplements issued with the NEWS last year, viz.:—"Penzance Harbour," by Col. Noverre (February 14th); the first magic lanterns (March 14th); Portrait of Thomas Wedgwood (April 11th); Specimen of Ancient Bookbinding, reproduced in chromo-collotype by Messrs. Waterlow and Sons (July 11th); Charles Kingsley's House and Church, Eversley (August 15th); and Mr. Cembrano's "Richmond Bridge" (September 26th). As you say, many of these are worth framing; but, if you bind them, we would suggest that they be put in together at the beginning or end of the book, so as to avoid putting the plates between the leaves of printed type, for fear of a possible set-off and consequent injury to them.

B. T. (Aberdare).—*Faulty Albumen Prints.* From inspection of your samples, the albumen surface seems to have fleeced off by reason of too weak a silver bath having been employed for sensitising the paper; try the use of a stronger bath for the purpose of more effectually coagulating the albumen.

J. M. (Colchester.)—*Freezing of Developers.* The addition of alcohol, where permissible, will retard the freezing of developers and other solutions during these cold nights, but it would certainly be advisable to set up a little gas stove.

M. I. C. E.—*Electrical Engineers.* Continuing the announcement made at the foot of page 38, it may be of interest to know that a fine portrait (steel plate engraving) of the newly elected President of the above Institution, Mr. William Crookes, F.R.S., has been issued with the current number of *The Electrician.* It is an admirable likeness of our friend, the founder and first Editor of the NEWS.

J. T.—*Nominations, Phot. Soc.* Wednesday, 21st inst., was the last day for sending in nominations for council and officers. Your letter does not make it clear whether you have already taken steps, or now desire to do so. Upon this point we answered you in good time last week.

A MEMBER.—*Blistering of Lantern Slides.* The cracking of the varnish and blistering of the picture representing a group of astronomers during the exhibition of this slide in the oxy-hydrogen lantern last week, was an unfortunate occurrence. We cannot tell whether it had been recently prepared or varnished, but imagine that another transparency could be easily procured.

L. P.—*Brown Tones on Bromide Prints.* You were asking some time ago how these brown and reddish brown tones on bromide paper could be obtained? By reading Dr. Hermann Gunther's letter in last week's NEWS, page 40, you will get some useful practical hints, and a formula fully stated for working out your requirements.

PROF. G. S. B.—*Cyanotypes of Sea Weeds.* Putting together all that Mr. William Lang, junr., has written on the subject, it seems probable that the two volumes of "British Algae," by Mrs. Atkins, were obtained at the sale of Mr. Robert Hunt's library on the 7th of November, 1888. If so, the handwork of this lady was never published, but produced only for private circulation. There is another copy in the British Museum Library. See Mr. Lang's article in the YEAR-BOOK, page 83.

C. L.—*The Scarf Pin Camera.* You will find details, with working sketches and reproductions of the miniature portraits, in the *Bulletin Belge* of November last. M. Edmond Bloch is the inventor of what is there called "la cravate photographique." It is not very different in principle to Stirn's camera, which also is intended to be worn beneath the vest, but the idea of bringing up the lens to form a scarf pin is ingenious and on occasion may be an improvement.

# THE PHOTOGRAPHIC NEWS.

VOL. XXXV. No. 1691.—*January* 30, 1891.



CONTENTS.



## PHOTOGRAPHIC LIBRARIES AND MUSEUMS.

Now that the Photographic Society has premises of its own, it has begun the work which should have been performed years ago, of establishing a lending library of books upon photographic, chemical, and artistic subjects. When the work is in an advanced state, it will probably tend to highly benefit the Society, for people —especially residents in the provinces—often become members of organisations, when the subscription is moderate, with no other object than that of getting access to a first-class library relating to a special subject.

The Photographic Society is also about to establish a museum, and has some funds promised to make a beginning. Other societies have been before it in this field of operations, for the Photographic Society of France has a valuable collection of historical objects and photographs, including some pleasing coloured landscapes taken by the curious process of Ducos du Hauron.

Not long ago, Mr. William England informed us that a valuable collection of ancient photographs was on view in a museum at Lille. Accordingly we went to Lille, and to the great art gallery and museum at the Hotel de Ville, but there they knew nothing about the photographic curiosities, and suggested that the Museum of Commerce should be tried. At the latter place, also, the officials knew nothing of any collection of historical photographs in the city, but two black-robed Catholic priests who chanced to be present opined that it might be in the Industrial Museum in the Halls of the Sugars, to which place they then guided and accompanied the inquirer, through many tortuous and narrow ways, for the Halls of the Sugars are in an out-of-the-way place, at the other end of Lille. The two French priests were kindly and jovial men, and had a merry eye.

In an upper hall was the collection of photographs, and it included a photographic proof taken direct upon paper in 1819 by M. H. Bayard, of Paris; Daguerreotypes taken upon plates sensitised by bromine, iodine, and chlorine, in 1842, by Blanquart-Evrard; a Daguerreotype of "Mother and Child," by Blanquart-Evrard, in the production of which chloride of gold and "accelerators" were employed; a Daguerreotype taken in 1841 by M. Vincent Chevalier, over which chlorine was first employed as a sensitiser, as indicated by Fizeau and Claudet; a specimen of the result of the first employment of chloride of gold to render Daguerreotypes more stable, 1839, by M. Bonofans, of Loos; a positive proof on paper by M. H. Bayard, 1839; a positive paper proof by Fox Talbot, 1839; an architectural view on a Daguerreotype plate by M. Lerebours, 1839.

An interesting item in the collection is a photo-mechanical print by Nicephore Niepce, 1824. He took a tin plate, covered it with bitumen of Judea dissolved in oil of lavender, dried it, and exposed to light in contact with an engraving under glass; afterwards he dissolved away the parts unacted upon by light by means of oil of lavender and turpentine, th n etched the plate with an acid to get an image in relief for printing purposes.

The collection also contains paper proofs, deeply printed and toned, by Blanquart-Evrard in 1846-47, likewise prints upon albumen from albumen negatives, produced about 1848. Old albumen negatives and early collodion negatives are exhibited, also photographic prints produced at Lille in 1851. Some among our readers may remember the curious photo-sculpture process and appliances connected therewith; one case in the Museum contains a set of the prints used in the manipulations. There are some beautiful prints in colours of flowers and leaves, taken by Ducos du Hauron; they are better, indeed, than the specimens in the Paris collection; various negatives by Ducos du Hauron are on view. Some photographs in natural colours by Edmond Becquerel, in 1848, are enclosed at Lille in three cases to protect them from the action of light; and near at hand is a protected photograph in natural colours upon paper, taken by Poitevin in 1865. Next is a stereoscopic view taken by Niepce de St. Victor in 1868. Early ceramic photographs by Geymet and Alker, Lafon de Camarsac, and M. C. Cousin, are on view; also some photographs on metallic leaves, by

Geymet and Alker, and by Cousin. Early astronomical photographs are in the collection, including one of the eclipse of the sun, taken in India, Aug. 18th, 1868, and a photograph of the spectrum of the solar protuberances. The various phases of the moon are represented in old transparencies by the albumen process on glass. A transparency upon mica is also to be seen.

A large burnt-in photograph, measuring about 8 in. by 8 in., is in the museum; it was produced by MM. Tessie du Motay, and Marechal, of Metz.

The photographic curiosities in this remarkable collection number about 120 altogether; they are not catalogued, nor is there anyone on the premises who can give detailed information concerning them; those particulars which are given above we gleaned from the tickets alongside the objects. They were presented to the public by the late Blanquart Evrard, who was a citizen of Lille, and a member of the Lille Society of Sciences.

From what has been said, it may be gathered that within a few hours' ride from London is a most interesting collection of historical photographs, which well deserve inspection. Many a busy photographer, who now and then, perhaps, has but from Saturday to Monday to spare, might do worse than to go to Dover by the London, Chatham, and Dover Railway, thence re-book and cross to Ostend by one of the Belgian boats, of which there are three a day, then in twenty minutes reach Bruges, the finest city in all Belgium for old ecclesiastical and secular edifices. Thence he might go to the Lille, and return by Calais and the South Eastern Railway. The circuit is a short one, but it includes much well worth seeing.

Considering the interest of the collection, it seems strange that so little seems to be known about its existence, even in the very city in which it is situated. "Full many a flower is born to blush unseen, and waste its sweetness on the desert air." Mr. Ruskin's little museum at Sheffield, some years ago, was outside the town in a little cottage, and was entered through a small door in the garden wall. In the museum was not so very much to be seen, but, if the visitor displayed real interest, the attendant would open wooden drawers and reveal the choicest articles in the collection, which the merely idle sight-seer would have missed. Mr. Ruskin is not one of those shallow individuals who exhibits all his best goods in his shop window.

---

For two or three months past a plan has been under consideration for the holding of a kind of "Photographeries" in the West End of London this year. The plan seems to be somewhat on the same lines as the Crystal Palace photographic exhibitions.

In Russia, says a daily paper, the use of the balloon as an aid to an army is continually being made the subject of experiment, and there can be little doubt that in the extensive plains which form so large a proportion of the surface of Russia the balloon must prove of utility. Experiments are presently to be carried out at St. Petersburg with the view of shooting from the cars of balloons, and also of taking photographic views of the surrounding country.

## PHOTOGRAPHIC IMPOSTURES.

Impostors are plentiful enough in every condition of life, and will flourish so long as "some people has branes and no money, and others has money and no branes," as a certain nobleman who a few years ago was "lanquishing at Dartmoor" was kind enough to remark for the benefit of an amused public. Imposters are sure to appear in shoals in connection with any branch of science or art which is capable of startling or apparently miraculous results. The art of medicine has, perhaps, produced as many of these gentry as any other occupation, and many fortunes have been made by ignorant adventurers with quack nostrums, which only required to be advertised with sufficient persistency to be patronised by eager buyers. The so-called science of phrenology has also produced many impostors, with whom may be classed the fortune-tellers, who are the modern representatives of the old astrologers.

Photography, being an art which produces pictures in a manner which, to ignorant minds, is akin to magic, has naturally attracted, from time to time, a number of those cunning individuals who hold the doctrine with regard to the wedding of brains with impecuniosity which we have quoted above. With just such a smattering of the art as will prevent them making any palpable exhibition of ignorance, they are able to play upon the fancies of those who know nothing whatever about it, and who are only too ready to swallow any statement which may be made to them, and to part with their money, provided that the tempter is sufficiently plausible in his address and unblushing in his impudence.

The recent exposure of the methods pursued by one or two firms who advertise largely that they will make a crayon portrait without payment, and then afterwards entice their victim into paying an extravagant price for a frame to put it in, reminds us that this is by no means the first shady transaction which has been started on a photographic basis. Photography in natural colours is, of course, advertised every few years as a thing which has at last been actually accomplished, and many hundred pounds have changed hands as the price of the valuable secret. The secret process-monger is, indeed, a creation of the art of photography, and has not confined his talents to the discovery of pictures in colour. At one time he has a patent enamelling fluid; at another a new developer. Next he will produce some marvellous method of toning a quire of paper with one grain of gold, or a magic liquid which will develop every plate into a perfect negative, whatever may have happened to it in the way of under or over-exposure. For a couple of pounds or so he will sell the secret to you, and if you are so foolish as to buy it, you will soon find out that you have been "had," and, for shame's sake, will hold your tongue. It is this reticence on the part of the victims to publish their own folly that enables these cunning fellows to make a good living.

In the Daguerreotype days, when people were not so well informed as they are now, and when the photographic amateur was as yet unborn, swindles were common. The general public did not even know that a good light was necessary for the successful production of a portrait, and they would often present themselves at the studio long after the afternoon sun had begun to approach the horizon. But a likely customer was not to be spurned away on this trivial account. His money was taken, the order was booked, and the innocent model was placed before the camera for a sitting of long duration. There was no sensitive plate in that camera, and the operation was only gone through in order that the sitter should have an idea that he was getting something for his money. He was told later on that the picture had unfortunately been unsuccessful, that it was too late in the day to take another, and would he call the following day, when &c., &c. Perhaps it is hardly fair to call the transaction a swindle, because there was no intent to defraud, and no doubt the portrait was duly executed the next day.

But under another category must come the dodge which has been exposed more than once, to which we next refer. This was practised by the wet plate process, and usually by two men, one of whom acted as tout, and the other as operator. Their stock in trade consisted of a perambulator fitted as a dark tent by means of a superstructure of the usual Hampstead Heath or Epping Forest pattern, and which contained the necessary chemicals, and *one* glass plate to fit the camera which they also carried. Their *modus operandi* was to call at a surburban house, and offer to take it for a certain sum. The idea was perhaps a novel one to the inmates, and they accepted the suggestion, grouping themselves on the doorstep, or perhaps at the windows, after paying the half-crown or other sum demanded by the enterprising artists. The negative was taken, and was shown to the clients, with the explanation that positive copies on card would be prepared, and sent to them in a few days' time. Then that deceitful operator would, as soon as he was round the corner, wipe off every trace of that negative image from his one plate of glass, and would polish up its surface for a fresh coat of collodion, in readiness for the next order for a house that the tout would manage to get for him.

Such are a few of the nefarious methods of getting a living which unscrupulous men have been able to elaborate out of a little photographic knowledge. But their field of labour is bound to suffer contraction now that a camera is such a common adjunct to a private household. It is a matter of surprise that, considering how ubiquitous the modern amateur certainly is, enough pigeons should have been found by the latest detected form of swindling to pay for the plucking. But then, of course, the grand formula with regard to "branes" already quoted is a factor which must not be neglected.

Photographers' Benevolent Association.—At the meeting held on 23rd of January (Mr. W. Bedford in the chair), three applications for assistance were considered and granted; and Messrs. Gray and Davies were elected as subscribers.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Development and Temperature—Warm Brown Tones with Bromide Prints—Transfers upon Stones without Grinding off the Previous Engraving—Rapid Hydroquinone Developer.

*Development and Temperature.*—An interesting paper was read of late before the Berlin Association of Professional Photographers, on temperature in development, by Dr. Miethe. It is well-known that, in general, cold developers act less energetically than warm ones; also, that cold developers give harder negatives than warm developing solutions. As regards the influence of heat on the reducing power of the developing substances, Dr. Miethe stated that this influence varied in different developers. With regard to the sensitiveness to temperature, the chief developers may be arranged in the following descending order:—Hydroquinone, pyrogallic acid, ferrous oxalate, eikonogen. Eikonogen, as regards reducing power, seems not at all to be influenced by temperature; hydroquinone, however, is subject to the influence of temperature to such a degree that, at 41° F., it was practically without any action on the exposed plate. Pyro-soda, as also ferrous oxalate, showed but slight action, even if cooled down below 32° F. Eikonogen, however, maintained a separate position; at low temperature the negatives turned out flat instead of hard, as in the case of the other developers. Dr. Miethe stated that, in his opinion, this was the cause of failures which many operators had met with in using this developing agent.

*Warm Brown Tones with Bromide Paper.*—In a previous letter I gave a description of Dr. Stolze's method of imparting to bromide prints beautiful reddish-brown tones; that description may now be completed by reproducing two formulæ given by Mr. Robert Talbot in the *Photographische Neuheiten*, which, as the author states, have proved to be very successful in his hands:—

1. With uranium nitrate. This method is very well suited for Eastman positive paper, as well as for transferrotype paper. After the prints have been fixed, washed, and eventually transferred, the following two solutions are prepared:—

*Solution A.*

| | |
|---|---|
| Ferricyanide of potassium ... ... | 5 grammes |
| Water ... ... ... ... ... | 500 c.c. |

*Solution B.*

| | |
|---|---|
| Uranium nitrate ... ... ... | 5 grammes |
| Water ... ... ... ... ... | 500 c.c. |

Just before use, equal parts of solutions A and B are mixed. The print is immersed in the solution until the desired tone has been obtained, then washed thoroughly, and placed once more in the fixing bath—

| | |
|---|---|
| Water ... ... ... ... ... | 100 c.c. |
| Hyposulphite of soda ... ... ... | 20 grammes |

After five minutes it is removed and well washed. The above gives warm red tones. Warm brown tones are obtained if the print is allowed to remain in the above bath until it begins to acquire a brown colour; it is then immersed in a weak alum solution, when it is rinsed, fixed as above, and again thoroughly washed.

2. With potassium chloride. Three solutions are prepared:—

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... | 1000 c.c. |
| Potassium oxalate ... ... ... | 330 grammes |

*Solution B.*

| | |
|---|---|
| Water ... ... ... ... | 1000 c.c. |
| Potassium chloride ... ... ... | 130 grammes |

*Solution C.*

| | |
|---|---|
| Water ... ... ... ... | 500 c.c. |
| Sulphate of iron ... ... ... | 24 grammes |
| Citric acid ... ... ... ... | 2 ,, |
| Potassium bromide ... ... ... | 2 ,, |

The paper should be fully exposed, and then soaked in clean water. Then mix—

| | |
|---|---|
| Solution A ... ... ... ... ... | 20 c.c. |
| Solution B ... ... ... ... ... | 5 ,, |
| Solution C ... ... ... ... ... | 5 ,, |

The more of B is taken, the browner will be the tone. The print is cleared, fixed, and washed as usual.

*Transfers upon Stones without Grinding off the Previous Engraving.*—A recent invention by the firm of Hyle and Klein, of Bannen, which will be of use to photo-lithographers, consists of making new and perfect transfers upon stones which have been used a few minutes before for printing, without grinding off the previous engraving. Turpentine is applied with a painter's brush in the case of recently used stones, while for old stones a dilute solution of nitric acid is used. The stone is then again covered with a stronger solution of nitric acid, washed off, and put aside until it is dry. After this, it is treated with a solution which is a secret of the inventors. Within about five minutes the stone will be ready for the new transfer. The same stone may be treated in the same way over again without being ground. The process has been patented in this country.

*Rapid Hydroquinone Developer.*—In the *Photographisches Correspondenz*, Mr. A. Lainer publishes the following hydroquinone developer, which is said to act quickly, so that the exposure may be materially shortened, giving at the same time very intense half tones:—

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... ... | 900 c.c. |
| Sodium sulphite ... ... ... | 40 grammes |
| Ferrocyanide of potassium ... ... | 120 ,, |
| Hydroquinone ... ... ... ... | 10 ,, |

*Solution B.*

| | |
|---|---|
| Caustic potash ... ... ... ... | 50 grammes |
| Water ... ... ... ... ... | 100 c.c. |

For use are mixed—

| | |
|---|---|
| Solution A ... ... ... ... | 60 c.c. |
| Solution B ... ... ... ... | 2 ,, |

The following formula acts as quickly as the previous one, but gives softer negatives:—

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... ... | 950 c.c. |
| Sulphite of soda... ... ... ... | 30 grammes |
| Ferrocyanide of potassium ... ... | 90 ,, |
| Hydroquinone ... ... ... ... | 10 ,, |

*Solution B.*

| | |
|---|---|
| Caustic soda ... ... ... ... | 30 grammes |
| Water ... ... ... ... ... | 90 c.c. |

For use, mix—

| | |
|---|---|
| Solution A ... ... ... ... | 60 c.c. |
| Solution B ... ... ... ... | 12 ,, |

---

The Photographic Society of Great Britain.—The annual dinner will take place at the Café Royal, Regent Street, February 9th, at 6.30. Tickets (6s. each) may be obtained of Mr. W. England, 7, St. James's Square, Notting Hill, W.; or the Secretary of the Society, 50, Great Russell Street, Bloomsbury, London.

## DEVELOPMENT.*

BY J. K. TULLOCH, M.B.

I have many good negatives developed with all the usual alkalis, alone and in combination; yet I cannot say that after all my labour to discover the best, I yet know which is best. I have abandoned everything but ammonia and pyro, and am getting on certainly as well, if not better, than when I used the others. By way of justifying my present position, I will give a few conclusions which in the meantime, at least, seem to me to be warranted. Using in every case pyro, I find that potash gives a beautifully delicate image, full of detail and of exquisite gradation, but not sufficiently obstructive of light to make a good printer. Even when made very dense, much of the half-tone is lost by being not opaque enough to impress its strength on paper. For this reason there is to my eye a peculiar oily softness (so to speak) about a potash-developed picture, fascinating to begin with, but soon getting distasteful. Soda gives a different effect; it gives an image with more pluck and obstructiveness to light, but in the process it buries detail. I am quite convinced of this; I have examined microscopically the image produced by soda as against that produced by ammonia, and find this to be the case. Rule a number of fine lines upon a sheet of white paper, photograph this, cut the plate into two pieces, and develop *to the same density*, one in soda and one in ammonia. My experience is—and I have tried this several times—that the ammonia-developed plate will show the lines much clearer and sharper than the soda. I cannot explain why this should be. There is less risk of fog with soda than with ammonia, and yet somehow the deposit seems not to be confined by the same keen edge. Many of my best pictures have been produced by a soda developer, and I dare say that, for large work, it is probably the most reliable alkali; still, it has that drawback where the picture must be delicate and fine, as for lantern slides.

One very good point about soda is its great power of giving density with over-exposure. Indeed, there is great latitude of exposure using soda. To come now to the ammonia pyro developer, which, in spite of many rivals, has no superior: Perhaps the first point to consider is the question, Why should the various formulæ differ so completely the one from the other? Without taking into account extraneous ingredients such as soda, sulphite, citric acid, you will find that the three *necessary* ingredients differ very widely in their proportions. To begin with, there are many different makes of plates in the market, each one working better with one composition of developer than any other. In the second place, one man works chiefly landscape, another portraiture. A developer safe enough for studio work would be eternally getting the landscape man into trouble from over-exposure, therefore he gradually alters his developer to suit the risk of over-exposure rather than under-exposure.

The real difficulty in development is not got over by getting a so-called *grand* developer. The difficulty is first to know when your picture is there before you, neither more nor less, and the only other item—and this only a small matter—to hit upon a good working plan suiting your plates, and over which you have the necessary control. Having said so much, you will be prepared to hear that I have no developer in particular to recommend. I think, however, I can say something to the point, especially to beginners. First analyse any formula you may

* Concluded from page 71.

want to try, and see that it is not just your own proportions differently stated. Secondly, do not imagine that, by changing the proportion of bromide some minute fraction of a grain, you are to notice a sudden and wonderful improvement in your work. A little longer exposure or a little longer in the developer will bring you just where you were again, perhaps quite unintentionally on your part. And, thirdly, recognise that if you know precisely *when* the picture which you are aiming at is before you, there is not much difficulty in bringing it there.

As I stated in the early part of my paper, my plan is to develop a thin image by means of a weak developer of no special formula; and after this is well out I pour it off, rinse the plate, and apply a more concentrated solution. Whether under-exposed or over-exposed, this is equally the best treatment, and leaves the operation thoroughly under control.

I have only two other points which I should like to mention. The first is that, after hundreds of experiments, I find none of the substitutes better than pyro. The second is, that in cases of under-exposure, if, after soaking the plate in developers, it be taken out before the solution begins to get brown, and washed gently under water, put into an empty dish and covered over with a sheet of glass to prevent evaporation, you will find as a rule a beautiful though thin image in a few hours, which will thicken up to any amount by a stronger developer applied then.

## TESTING THE SENSITIVENESS OF PHOTOGRAPHIC PLATES.

A long article appeared recently in the *Chemical News* from the pen of Professor Victor Schumann on "Determining the Sensitiveness of Photographic Plates by means of the Spectrograph." The author begins by speaking of Warnerke's sensitometer as an instrument of limited efficacy, but not entirely useless. In the case of orthochromatic plates, however, its advantages have, he says, become "seriously sceptical," even for practical working, apart from abstract scientific purposes, for no other light but blue is emitted by the phosphorescent plate.

All sensitometers, says the author, have been superseded by the trustworthy spectrograph, by the aid of which more distinct information on the sensitiveness of photographic plates is obtained. Whoever desires to learn of their relations to the action of light rays of different colours should resort to the spectrograph. Heavy flint glass, like that of the Amici prisms, should, however, be entirely excluded from the instrument; these glasses are impenetrable to ultra-violet. Violet even, and not less so indigo and blue, are held back with much energy, while the luminous rays, yellow and red, are allowed to pass through them without any hindrance almost. Such prisms must naturally lead to erroneous sensitometer numbers. On account of partial absorption, yellow is reproduced with excessive force, and plates found to be highly sensitive for yellow and red in the spectroscope will fail to show the same properties with objective exposures.

Lenses and prisms made of crown glass, or of light flint with less dispersive power, are preferable for ordinary purposes. With any camera, and without much trouble, a suitable spectrograph may be easily constructed. To obtain faultless spectrum photographs, a scrupulously correct instrument is not necessary. I have made the sharpest pictures with precision instruments as well as with apparatus but roughly built, and even professional spectroscopists have made the most astounding discoveries with improvised instruments.

To find the behaviour of plates towards any light source, a series of spectra, with regularly increasing time of exposure, should be photographed, the plates dried, and be examined in regard to the time required to produce a developable impression by different colours. The different sensitiveness will then be found to be reversely proportioned to the time of exposure. Were we, for example, to inquire how the sensitiveness of a Vogel eoside of silver plate (manufactured by Prentz, of Munich) is proportioned to our own instrument, the first spectrum of the series to be photographed should be exposed for such a short time as not to produce a developable impression. Subsequent and longer exposure will then generally produce an image of extremely feeble character—a mere breath upon the plate. The thinner the picture of the spectrum, and the clearer ground of the plates, the more reliable is the sensitometer number derived from the series of spectrograms made by increasing time of exposure. As long as sensitiveness alone is the object of inquiry, the intensity of the plate is of no importance whatever. It is totally wrong to determine numerical value of light-sensitive films by the density of the negative.

Sensitiveness and intensity are two entirely different things, as every photographer knows who understands the use of the sensitometer. How little hold is offered by the intensity of the plate, when inquiring into its sensitiveness, is proved by the fact that the two never go hand in hand. Some plates resist strenuously the action of certain rays before decomposition of the light-sensitive components takes place; but when their stability has yielded at all to the force of the developer, the intensity of the negative increases with much rapidity. Density builds up easily when the exposure has been longer than required for the production of the breath-like picture; not proportionately, however, but progressively. This phenomenon occurs with Vogel's eosine plates to an unusual extent. A hundred times have I had opportunity to observe these properties when associated with Dr. Zettnow, of Berlin, and to whom we are indebted for the most important researches on erythrosine plates, to examine extensive series of orthochromatic plates. Other phenomena occurring and observed by studious investigators may be well explained by this progressive increase of density, pre-eminently among them two peculiarities—the very changeable intensity of the maximum in yellow, and different yellow action even under strictly normal conditions.

Whoever wishes, with the foregoing explanation on hand, to determine the yellow and blue sensitiveness of erythrosine plates, will find that the former never reaches the height, numerically, stated by Dr. Vogel when the exposure is made at high altitude of the sun. Far from mid-day, or in winter time, the proportions of brightness in the sun spectrum are entirely changed. The general sensitiveness of the plate advances then more and more towards the red end of spectrum. When the sun stands low, at its rise and set, the erythrosine silver plate may triumph to a still greater extent, for then it is nearly exclusively sensitive to yellow and red, but to no other rays.

There will be a photographic exhibition at the Crystal Palace in the course of this year.

## PHOTOGRAPHIC TOURISTS IN ICELAND.*

BY J. REYNOLDS, M.D., F.R.G.S.

Mr. President, ladies, and gentlemen, I purpose, as you already know, to give you a short description of a tour in Icelaud which I, together with seveu other gentlemen, made in July of last year. But before I proceed to describe the tour, and places visited, it may not be amiss to give you first of all some idea of the situation of this strange land of fire and frost in the far north.

*Slide* 1 (showing map).—Iceland, then, is situated in the North Atlantic, between the 64th and 66th degrees of north latitude, about 650 miles west of Norway, and some 410 miles from the east coast of Greeuland. One of the headlands projects just one mile north of the arctic circle. In area it is one-third larger than Ireland—*i.e.*, about 38,000 square miles; of this area about 7,500 square miles are lava deserts, and sandy, stouy wastes. The lava tract around Heckla alone is about 240 square miles, aud iu the south-western portion of the island, with which chiefly I am concerned to-night, there are about 500 square miles of couutry covered with lava.

The total area of pasture land does not probably exceed 14,000 square miles. The glaciers, lava, and sand deseits, moorlands, and pasture cover about 28,000 square miles, and the remaiuiug 10,000 consists chiefly of mountain masses, varying in height from 2,000 to 3,500 feet, snow-covered for nine months out of the year. No doubt the inclemeut character of the climate for three-quarters of the year, together with the isolated position of this interesting land, accounts somewhat for the general ignorance respecting nearly everything conuected with the country.

I will first glance over the map and point out to you the relative position of the various important points in the island. Vatna Jokull, Askja, Skaptar Jokull; here in 1783 was the greatest lava flow ever known in Iceland or elsewhere, when lava welled forth beneath the sea and built up the island of Eldey, one hundred and fifty miles distant.

Here we have the world-famed Heckla, and here the Geysers; here is Gullfoss, Iceland's largest and grandest waterfall; and here is the classic Thingvellir. I want you to bear these positions in mind, as I shall this evening show you some scenes photographed by me iu the actual spots indicated.

You can get to Iceland by two routes; one is by the Iceland and Leith Steamship Co.'s boat *Magnetic*, starting from Leith and going direct to Reykjavik in about four days; and the other is by the Danish steamboats, which run between Copenhagen and Iceland, and call at Granton for mails and passengers *en route*. The quickest route is undoubtedly by the Scotch boat, but the most comfortable passage is certaiuly that by the Danish steamer. We started from Leith iu the Scotch boat on June 30th, arrived at Reykjavik early on the morning of July 4th—*i.e.*, in about three aud a-half days—and at ten o'clock on the same morning we landed; we went to the "Hotel Island," in the main street.

*Slide* 2.—Here all was strange and new, and we hardly knew which way to turu first, so in order to collect our scattered thoughts we sat down to breakfast, and this is what we had: black bread, raw salted herrings dressed with raw onion, raw salmon, rolled cooked mutton, hard boiled eggs cut in quarters, raw ham, anchovies, white bread and very good Danish butter, lobsters, splendid coffee and cream, and schnapps. Well, I ate all I came iu contact with, and asked no questions—the best way when you are in doubt, especially in Iceland. Several Icelandic gentlemen were present, and welcomed us most cordially to their shores, and at once anuounced our arrival and inteuded route in their newspapers. Breakfast being over, we went out to see the town, and to photograph some of the chief places. Now I will show you something of what we saw.

*Slide* 3.—Here you see farther up the main streeet the very picturesque wiudmill on the top of the hill; this is the main road and exit from the town wherever you want to go, and whichever route you desire ultimately to take.

*Slide* 4.—The next view is one of a side street leading down to the shore of the Faxa Fjord. Here you see oue of the modes of drying the fish; it is first split open, aud then laid on the lava blocks forming the walls of the garden to dry in the sun until it is as hard as boot-leather; this article is now collected iuto bundles aud tied together, and either sent to the interior or exported.

*Slide* 5.—This view shows you some of the genuine old Icelandic houses called "boes." You will see that the walls are built of blocks of lava with slabs of turf interposed, and they are made four or five feet thick to keep out the cold of the long and extreme Arctic winter of nine months' duration. Resting ou these walls is a timber roof covered over with large living turfs. Each of these houses has, usually, a square space of grouud enclosed with a low wall made of the same kind of lava blocks, aud this is called a tun. The floor of these houses is the bare earth. In one of the roouis there is a peat fire, and the smoke, in some of the houses in the interior, is allowed to find its way out as it best can, not a very bad arrangement in Iceland, as it possesses certain disiufecting and deodorising properties. The lava walls, which are quite clean, are, as you see, also used for drying clothes.

*Slide* 6.—I will now show you a view illustrating the mode of shippiug ponies. These sure-footed, amiable little beasts are one of Icelaud's chief exports, the others being sheep, eider-down, and dried fish. You will observe that the little creature is in no humour to quit his native shore, and no wonder, when I tell you that his most probable destiny is a coal mine in England, and that, when once let down the shaft, he will never see daylight again.

*Slide* 7.—This is simply another view of same kind of industry.

*Slide* 8.—A still farther illustration, showing also a portion of the shore view of the town.

*Slide* 9.—Here we have a scene showing how goods are taken from the landing stage for shipment.

*Slide* 10.—Here we have a view of the Faxa Fjord from the shore, showing in the foreground a fisherman's hut, and a woman engaged in splitting open the fish, numbers of which, ready-prepared, are drying on the beach in the sun; in the distance you see the shipping, and the steamer *Magnetic* lying at anchor.

*Slide* 11.—Yet one more shore view; this time at the east end of the harbour.

*Slide* 12.—Now we will take a view of the part of the town supposed to be aristocratic. This square shows the statue of Bertel Thorwaldsen iu the centre.

*Slide* 13 shows the cathedral aud part of the Althing House; the former is a very plain building covered with plaster, and washed over with pale orange, which is a wretched colour to photograph; hence the result.

*Slide* 14.—Here we see the interior of the cathedral, which, although Lutheran, looks at first glance like the interior of a Roman Catholic church.

*Slide* 15.—This shows the interior of the chief room in the parliament house (called Althing House), with a portrait of Sugurdssou, the liberator of Iceland, whose memory is revered by every true Icelander.

*Slide* 16.—This is a nearer view of the statue of Bertel Thorwaldsen in the Square. Having taken these views duriug Friday aud Saturday, we finished up by having four of our party arrested for furious riding. Reykjavik possesses *one* policeman, a most gorgeous official resplendent with gold lace, and I suppose he thought such an opportunity of running in four Englishmen should on no account be lost, so he brought our four companions before the Governor-General, and these were fined two krone apiece; I need hardly say this policeman's life was no siuecure during the remainder of our stay in Reykjavik. We decided to start for our first resting place on the tour on Sunday morning at teu o'clock, but this wretched limb of the law again stood in our way, and threatened to arrest and fine us if we started for Krisuvick before three p.m., so we sent our baggage aud apparatus on first, and waited until the appointed time, then off we started, four guides and eight of ourselves, making twelve in all, and about forty pouies, at a good sharp trot.

*(To be continued.)*

* A lecture delivered last week before the Brixton and Clapham Camera Club.

## A REPLY TO DR. EMERSON'S RENUNCIATION.

BY GEORGE DAVISON.

There are one or two matters of public interest in Dr. Emerson's eccentric "Renunciation," and one or two requiring personal reply, which I should like to refer to briefly. It would be waste of time to take this undignified production too seriously, for it is evidently only the outcome of violent egotism and offended vanity.

First, do not let photographers suppose that Dr. Emerson has the right to claim any originality in regard to naturalistic art. He has merely adapted to photographic methods ideas current among certain artists. He is, therefore, neither entitled to claim further recognition than this, nor has he the slightest right or power to order the funeral of naturalism in photography. Secondly, the limitations of photography are not so great as he now . . . . wishes to make out, for the individuality of the worker is freer than he asserts, and he has allowed himself to be misled by an absurd confusion about Messrs. Hurter and Driffield's experimental results. The power to alter relative values by exposure, development, and other purely photographic means is infinite. Thirdly, if "all writings and opinions upon art are as the crackling of thorns," why does Dr. Emerson return to his vomit in this pamphlet, and re-discuss certain art matters; and why, in the name of all that is consistent, does he threaten photographers with another book on art later on? Fourthly, what on earth has "the dexterity" of the man with paint and brush to do with the matter? The photographer's dexterity as an artist is *not* a matter of a few weeks. It takes as long as the artist's to cultivate. It is a mental training, and the handicraft follows the brain. Fifthly, Dr. Emerson is wise to give up every "school" title, and to take to admiring "all good artists and all good art." It is what every sensible person has always wished to do, and after passing from one violent extreme to another we may hope he will in time reach a reasonable medium. Sixthly, I believe it to be false that anyone has claimed novelty in the use of rough papers. All the same, these pictures have spoken and will speak for themselves to those who are less amateurs than Dr. Emerson, who has, "by the sweat of his brow, learned under a master!" Long before Col. Noverre's excellent specimens were exhibited, I, and probably many besides, had spoken to Mr. Willis and others about the necessity for such rough-surfaced papers. . . . . Eighthly, Dr. Emerson's repudiation of the claims of photography as a means of capable artistic expression is perhaps only natural. In my opinion there is something sadly wanting in most of his photographs, and he himself is probably now finding this out. I trust he is devoting himself to some other pursuit more suited to his abilities—a humorous friend of mine suggests fretwork.

In regard to the personal matter, and what Dr. Emerson calls my "superficial knowledge," I shall be well pleased to let my photographic pictures speak for themselves, and stand side by side with his before any competent and unbiassed judge. The quotation used from my private letter seems to me to read in refreshing contrast to the rest of the pamphlet. Dr. Emerson was anxious *at that time* to recognise what I had done for naturalistic photography. I was not, however, particularly anxious to be very closely identified with Dr. Emerson and his violent aggressiveness. A little of the same appearance of modesty would not injure him. The whole of this business appears to have arisen first in that I dared in a very appreciative criticism to point out Dr. Emerson's weakness in respect to treating figures in photographic pictures. In reply to that he wrote: "You are wrong about my figures; they are as yet alone"—a sweet bit of Emersonian modesty. From that time, although treating with me to write for a journal he proposed to start which was to knock everything else endways, he seems to have begun to say hard things about me to others. That I should have ventured to differ from him in respect of the qualities of diffractive photographs caused him further attacks of spleen; and, finally, the fact of my being invited to read a paper at the Society of Arts appears to have upset the whole of his years of study on naturalistic photography, and wrought him up to the pitch of fulminating this . . . pamphlet. The letter which he calls an "expostulation," and to which I sent no reply, was one long, violent insult, alternating between threats and wheedling. . . . .

As to the unfairness he complains of at the Society of Arts, he does not mention the name of the friend whose speech was misreported. It can hardly have been Mr. Maskell or Mr. Newman, and they were the only speakers who *read* their speeches. All the reports seem to me to be fairly accurate so far as they go.

Finally, I do not wish it to be supposed that I do not sympathise with Dr. Emerson in his affliction. There are some grains of sense in the pamphlet—more, indeed, than could be expected from anyone even with a good liver after three and a-half months' solitary study in a house-boat during the recent weather. But every reader ought to be cautioned against paying much heed to the outbursts of one who is blown about by every wind of doctrine—now a well-expressed word of a "great painter," now the influence of a common every-day artist, and now a misunderstanding of a scientific experiment. Give such an one three and a half months' further confinement in a house-boat and a fresh quarrel, and a new crop of theories or burning thereof may be expected. It is certainly to be hoped that no photographer who is working out his own salvation by serious study and practice will be deluded by such cheap trash as this pamphlet contains. Let Dr. Emerson cast all the copies of "Naturalistic Photography" upon the dust-heap; let him—as I think wisely—succeed in covering up the crude and absurd directions "To the Student" in every one of the volumes of "East Anglian Life," which, with his genius for advertising himself expensively, Dr. Emerson sowed broadcast over the country—let him do all this and go on "renouncing" to the crack of doom, and he will only publish his own vanity, and will not be able to stem the tide of advancing culture amongst photographers.

[Owing to the provocation given in the pamphlet of Dr. Emerson's which we reprinted last week, to our valued contributor, Mr. Davison, it is only right that we should insert his reply; but as warm discussions of this kind scarcely answer any useful purpose, we shall let the matter drop after this, unless the disputants confine themselves to non-personal artistic and scientific arguments of interest to the public. We have omitted a sentence or two from Mr. Davison's article at places marked by dots.—Ed.]

Photographic Conference.—The Camera Club will hold its Photographic Conference for 1891 on Tuesday and Wednesday, April 7th and 8th, in the rooms of the Society of Arts. The chairman will be Captain Abney, R.E. On April 7th there will be a lantern slide exhibition.

## PHOTOGRAPHY AND ILLUSTRATED JOURNALISM.*

BY CARMICHAEL THOMAS.

FOR many reasons I am sorry to see the good old-fashioned wood-engraving being superseded by the many mechanical processes which are being perfected; but I am quite sure that, in time, the really good wood-engravers, instead of finding their work leaving them, will find they are more and more sought after. The fourth-rate engraver no longer exists—he is ousted by process; then the third-rate engraver disappeared. The second-rate men are now having a fairly good time of it; but they must look out, for we do not know what further developments are coming on in mechanical process.

In the future, I believe, the first-rate engravers will be able to command almost any price for their work. For the last few years there has been a mania for etchings; high prices have been paid and are being paid for etchings, simply because they are etchings, no matter whether good or indifferent; but the etchers will be—no doubt are—feeling the change; photographic processes in the shape of photogravures are gradually pushing the second-rate etchings out of the market, just in the same way as the poorer class of wood-engravings are being superseded. I should not be at all surprised if, in a few years' time, a good wood-engraving is as much sought after as an etching is in the present day. The first-rate wood-engraver will make his fortune, while his second-rate fellow-worker will starve.

In America there is another startling change in illustrated journalism, for some of the papers there are not only giving up the wood engravers, but they are giving up the artists as well. The illustrations are composed of photographs taken from nature or life, and reproduced direct by process without a touch from either artist or engraver. The manager of the paper, instead of asking an artist to illustrate a story, puts the manuscript in the hands of a photographer. Here, on the screen, is a story illustration prepared in that way. In another case, the manager wishes to illustrate the work being done by the Salvation Army in New York, and sends the photographer round with the reporter, instead of the artist. The result is most terribly monotonous and devoid of artistic treatment, but I think it is interesting here, as showing the latest development of illustrated journalism.

There is the advantage, though, that an illustration produced in this way cannot well have doubt thrown on its genuineness. If I were to show you a sketch in which the old lady who keeps the cows in St. James's Park was seen putting water into the milk, you might say it was made up; but when I place before you a photograph of such a proceeding, you must then admit, although all your better feelings are rudely shocked by the revelation, that it is true.

One more subject I will put on the screen before I leave this part of my paper, and that is the one you now see. In this case there is no artist's work; the photo from life was taken on board a P. and O. boat, sent to the *Graphic* office, where it was photographed direct on to the wood, and engraved.

Where photography is so very useful is, not as a means of doing away with the work of artist and engraver, but of assisting them to get the details of their subject correct. Twenty years ago, during the Franco-German War and the Commune, the camera was a most important and valuable friend to the newspapers. When Paris was at the mercy of the lowest ruffians that the slums could produce, at the time when they were playing havoc with the buildings, monuments, and streets, the photographers were hard at work, and the negatives they took give a true but dreadful picture of those terrible days. On the screen will be shown one or two specimens of what I refer to.

This shows the Rue Royale deserted and partly in ruins, taken during the last days of the Commune. The next is a scene on the Boulevards. The next shows the Rue de Rivoli; the damage to the houses is caused by shot and shell, not by fire. One can hardly believe that this bright and cheerful street could ever have been a scene of such utter desolation and misery as you see here. The next one depicts a barricade in the Rue Castiglione, taken from the Place Vendome.

All these subjects appeared in the *Graphic* at the time, and show how important a part photography played even as far back as twenty years ago. The next slide is a photograph of one of the meat tickets which was supplied to the *Graphic* agent (among others) during the siege. The ticket itself was far too valuable to be sent, so a photograph of it was taken and forwarded by balloon post. It was necessary to send two or three photographs by different balloons, or if sketches were used, to send tracings of them, for as likely as not the balloons would be captured by the Prussians, and whether they came down within reach ot the enemy or not, the *Graphic* had to give its readers illustrations of all that was going on in the beleaguered city. Many manœuvres had to be executed to get the sketches and photographs outside Paris, and through the Prussian lines to London.

Any sort of meat was ruinously dear at that time, and even a good sized dog could not be bought under £8 or £10. This slide represents a cat and dog butcher's, prepared from one of the sketches received at the *Graphic* by balloon post. The day's dinner was not the only trouble; anxiety of every sort was there as well.

When the *Daily Graphic* first started, some of the illustrations were drawn on wood and engraved, but the result was not satisfactory; and now they are produced by a photographic process from drawings made on smooth white card with a very black ink. There have been published some very good illustrations done by people who have had no experience whatever in such rapid journalistic work as is necessary in the case of the *Daily Graphic*. Lady Butler has sent sketches from Egypt, done with such a bold, vigorous touch that they can be used as model drawings for the kind of work required. There is just enough work in her drawings, not too much to obscure the clearness, and yet quite enough everywhere to show exactly what she wishes to portray.

When the drawings are finished, they are handed to the manager of the photo-etching department, who prepares the plates for the printer. The camera by means of which the negative is taken is slung from the roof, so that the vibration of machinery or passing traffic may not spoil the result. The negative, when taken, is placed over a sheet of zinc which has been made sensitive to light, and this light (from an arc lamp) shining through the clear lines of the negative, acts upon the sensitive surface in such a way as to leave a record upon the zinc. In short, by this operation the drawing is reproduced upon the zinc plate. Its lines are then made to resist the attack of the acid, and the plate put into an acid bath, where the non-protected parts are eaten away, leaving the drawing in relief—a surface which can be printed from.

These plates are then sent to the printing office, and, having been mounted on wood in order to make them the same level as the type, they are, with the type, arranged as required into complete pages.

Mr. Luke Fildes, R.A., presided at the meeting at which the foregoing paper was read for the author by Mr. T. C. Hepworth. The attendance was large. In the course of the discussion Mr. Henry Blackburn said that it was about the year 1875 when it became possible to turn out by photography type-high blocks in a practically available way for newspaper printing. Mr. Russell Scott described a newly invented method of producing pictures of various colours at a rapid rate with one impression from a single lithographic stone or block.

* A portion of a paper on "Illustrated Journalism," read last Wednesday night before the Society of Arts.

---

MAKING PAPER TRANSPARENT.—The following method of making paper transparent for copying drawings is adopted by the Austrian Hydrographic Bureau:—The sheet of paper, having been placed over the drawing to be copied, is lightly rubbed with a ball of cotton saturated with pure benzine. The tracing can then be readily made, owing to the transparency produced, and the benzine on evaporating, leaves the paper opaque, as before, and perfectly odourless. To secure satisfactory results, however, absolutely pure benzine must be used.—*Illustrations.*

## LANTERN SLIDE MAKING.*

BY EDGAR G. LEE.

CONFINING my work almost entirely to the production of lantern slides, I have thought it expedient to take up a portion of your time to-night by contributing a few rough notes on this interesting and important branch of the photographic art.

At the present day, by far the most popular process is the gelatino-bromide, although the collodion, both wet and dry, and other processes, give more latitude as regards the production of a good slide from an indifferent negative. First of all, it is necessary to consider what constitutes a good slide: one in which the highest lights are represented by clear glass, and the deepest shadows are of such a density as to be easily penetrated by a fair average light in the lantern. A good slide need not be composed of, say, equal proportions of clear glass and opaque deposit, like more than one make of commercial slides in the market. So long as we have a trace of clear glass to add brilliancy to the picture on the screen, it may with advantage, as seen *out of the lantern*, appear a trifle thin.

To produce this *good* slide, having the characteristics which I have mentioned above, a negative is required showing considerable contrast. Personally, I prefer one of the type which yields a brilliant or plucky silver print. Whilst, on the one hand, a negative of the most extreme density will make a passable slide, thinness and want of contrast of the character which is suitable for bromide printing is, for slide work, absolutely hopeless.

Coming to the actual working, we have two methods: we may reduce in the camera, or print by contact from small negatives. To the latter method I confine myself almost entirely, as nearly all my negatives are quarter-plates. The first point to be considered is naturally exposure, which may be made to a paraffin light, gas flame, or magnesium light—daylight, of course, being too strong and uncertain. Gaslight is, generally speaking, most useful, and exposures with the printing frame two feet from an average burner may run from thirty seconds to ten minutes, varying according to the density of the negative. For very dense negatives, exposure to magnesium light is to be decidedly recommended. With a negative verging on thinness, the exposure must be fairly exact, but with a dense negative and certain brands of lantern plates the latitude is simply enormous, and much greater than is usually supposed. With such a negative the exposure may be ten times the normal, and a perfect slide result from it—of course, varying in tone according to the extent of exposure. I have observed that the general tendency of beginners is to under-expose, which is fatal, as the image either develops up patchy, or veils over before density is obtained. A lantern plate can *not* be forced in development.

As to development, we have the choice of four reducing agents: ferrous oxalate, pyro, hydroquinone, and eikonogen. Each and all of these are capable of producing equally good results in the hands of careful workers. The easiest, by reason of the latitude it permits, is hydroquinone, the tone being dependent partly upon the negative, partly upon the exposure, and in no small degree upon whether the development is rapid or gradual, a remark which will be found to apply to any developing agent. It is not my intention to recommend any one formula, believing as I do that there is nothing magical in any prescribed combination of chemicals. My advice would therefore be to choose a well-tried and reliable formula, and stand by it.

For warmth of tone pyro is, without doubt, the best developer, and as the tendency is now in that direction, it merits our attention. There is no difficulty in its use if we remember its staining properties, to counteract which it is always employed with a much larger proportion of preservative.

The image, when fully developed, has an over-done, sunk-in appearance, and unless this point is arrived at, the slide, when taken from the fixing bath, will be found much too thin.

After fixing in a perfectly clean hypo bath, and a thorough washing, the slide will in all cases be the better for a short immersion in an alum and citric acid bath, which clears up the picture and improves its brilliancy. If too dense, or fogged beyond the capacity of the acid bath to reduce, the ferricyanide of potash and hypo reducer (made distinctly alkaline with ammonia) should be resorted to.

Intensification at its best (which best may be represented by mercury and cyanide of silver) is but an unsatisfactory proceeding, and much the better alternative is to make another slide. Intensifying by mercury, followed by various alkalies, yields warm tones, varying with the agent used, many of them very fine, but all of doubtful permanency.

After fixing and washing, slides may be toned in a gold and sulphocyanide bath through a long range of bluish tones, useful for moonlight effects.

Mounting calls for no particular mention, but I cannot refrain from adding a vigorous protest against the continued use of masks of circular and other eccentric shapes. Broadly speaking, the oblong form suits most subjects, and produces the best effect. A safe rule for guidance is to fit the subject to the mask when taking the negative, and not to fit the mask to the subject at the last moment before binding the slide.

* A communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.

INCREASING THE SENSITIVENESS OF PHOTOGRAPHIC FILMS.—The following process is by York Schwartz, of Hanover, Germany. It consists in mixing the materials for making the film with, or coating the photographic films with formaldehyde or a compound of formaldehyde with bisulphite salts. The process is based on the discovery that the sensitiveness of silver compounds to light is materially increased, or that the effect of light on the same is continued by the presence of formaldehyde, or a compound of formaldehyde with a bisulphite of an alkali metal, or of ammonia, or of substituted ammonia (capable of forming bisulphite), in the sensitive silver compounds. For photographic purposes these discoveries may be utilised as follows:—First, by adding one or more of the specified compounds, either alone or in mixture with other substances, to the substances for making the films at the time of the production of the sensitive film; second, by bathing the finished photographic film in a solution of the said compounds or mixtures before the film is exposed to light; and third, by treating the photographic film after exposure with a solution of the said compounds or mixtures. In this case the changes produced in the film by the action of the light are continued, so as to obtain in this manner the same result as by a correspondingly longer exposure to light. The application of the said compounds constitutes an important improvement in the manufacture of photographic films, because they possess in an increased measure all advantages of the substances hitherto employed for similar purposes, without sharing their faults—for instance, the tendency to form clouds or specks, or of imparting a yellowish tint to the film. —*Scientific American.*

## Notes.

Photography is still making headway in India. The Photographic Society of India now has 270 members, and the increase has long been at a steady rate, so some additions have been made to the body of managers. Those recently elected to serve are Colonel Rogers, Messrs. J. H. Lane, A. L. H. Palmer, W. H. Jobbins, and Captain Hayes. The new honourary secretary is Mr. T. A. Pope; the new president of the Society is the Hon. Sir Comer Petheram, Chief Justice of Bengal. The new committee of the Society does not like the proceeding of the old one in abandoning the International Photographic Exhibition, and has passed the following resolutions:—1st. That this committee regrets the decision arrived at by the late committee to abandon the holding of au International Exhibition. 2nd. That this committee believes the postponement of the Exhibition would have been sufficient to meet the case. 3rd. That this committee decides to cancel the previous committee's decision, and to hold an International Exhibition on the 15th March next and following days, and empowers the Hon. Secretary to notify the same in the press. 4th. That a sub-committee be formed to make all the necessary arrangements to secure the return of the foreign exhibits now lying in Calcutta awaiting despatch to the senders, and to arrange for the return of such exhibits as have been already sent back by post.

---

A pretty contention has now been launched upon the photographic world in relation to the best form of condenser for the magic lantern. Mr. Lewis Wright has issued in this country a book upon the lantern, and Mr. Andrew Pringle has launched one in America. In both triple condensers are spoken of as if no more practical use than one of the ordinary double form. Mr. Traill Taylor, however, who is an authority upon this subject, stated at the Camera Club that triple condensers transmit much more light, also that all the best lanterns in the United States have triple condensers. Last Tuesday, at the Photographic Society, Mr. W. E. Debenham made some remarks in favour of the triple form. One of the most essential points in a good lantern is, that it shall have the best possible condenser, and it is remarkable to see two books on the subject in error, as we believe, about a vital element in the construction of an optical system of the better form, such a system as will, according to a diagram by Mr. Taylor, nearly double the amount of light thrown upon the screen. Mr. E. J. Wall, in his new "Dictionary of Photography," adopts Mr. Taylor's views. The triple condenser being right in theory, the two authors display bravery in flying in the face of strong authority, including that of the screaming bird once described in Court by an American lawyer, whose client had stolen a pig, as "The glorious eagle of our country, which stands with one foot on the Atlantic Ocean, and the other on the Rocky Mountain, waving aloft the star-spangled banner, amid the wreck of matter and the crash of worlds!"

---

The Photographic Society is now domiciled in its new rooms, and before long will, no doubt, begin to feel comfortable therein; but at present everything looks newly finished. The entrance is directly opposite to the entrance to the British Museum, and in the library of the latter is a wealth of literature relating to photography. There is no name or plate on the door of the new establishment, and the first flight of stairs is scarcely lighted at all at night, so that some people have entered and left the doorway under the impression that it was the wrong house. The Autotype Company has lent some fine photographs to decorate the walls of the room. Among them are some Alpine peaks photographed by the late W. F. Donkin, a sea-view by Mr. Mayland, a lion by Mr. Gambier Bolton, and a view of Palmyra. The proximity of the offices to the British Museum will prove highly convenient to those photographers who are likewise literary men.

---

The refreshing novelty of the primuline process, and its excessive cheapness, ought to present attractions to the general public if brought under their notice. One way of doing so, when a professional photographer has a transparency of a sitter, is to offer to mark his pocket-handkerchief with the sitter's likeness; on a sunshiny day the whole operation can be gone through and finished in about fifteen minutes, and the sitter sent away rejoicing with a portrait upon cambric of himself in gorgeous colours, which will resist the action of hot soap and water. Recently, at a photographic conference in Lyons, the primuline process was spoken of by M. Léon Vidal as one of peculiar interest to that city, so celebrated for the excellence of its silk manufactures.

---

The other day we were at a lantern lecture where a somewhat unusual episode occurred. The top of the lantern front, just above the upper condenser—the instrument was a biunial—took fire. We also noticed that the top lantern, previous to this mishap, had, compared with the bottom one, been giving a very poor light. The instrument, we may add, was of first-rate construction by an eminent maker, but the operator had not used it previously, although it had been in constant and successful use in the hands of others. The flame was speedily suppressed, and the lecture was continued without the use of the top lantern, the cause of the mishap remaining for the time a mystery.

---

After the lecture was over, we had an opportunity of enquiring into the cause of the *contretemps*, but could obtain no clue until we examined the lime cylinder which had been in use. This we found to be indented with a deep pit where the full force of the blow-pipe flame of the mixed jet had impinged upon it. The cause of the fire now became obvious. The operator had either neglected to turn the lime, or the turning apparatus had failed to act. A cavity had gradually formed in the cylinder, and had reflected the flame on to the upper part of the woodwork, which had taken fire in spite of its metal lining. Had the flame been reflected to a lower point the condensing lens would have been broken, for many have been fractured from a similar cause. The operator would do well to remember the advice which the bells of London seemed to whisper to a celebrated personage on Highgate Hill: "Turn again, Whittington." We need hardly add that the paucity of light was due to the same cause as the ignition of the lantern.

---

Messrs. Marion are about to place on the market a new form of hand or detective camera, which is very novel in design, and which we hope to notice at length in a future number. But there is one novel point connected with its manufacture which we think is of extreme interest, and which will most probably point the way to doing work of a similar character. The most notable feature of the apparatus is a fan-shaped arrangement of metal grooves, in which the plates are stored. These grooves must be most carefully made in metal, and must each be correct in form to a hair's breadth. They could not easily be stamped, and it was out of the question to make each one by hand, so the device was hit upon of producing them by the electrotype process in copper. From a suitable mould, these pieces of metal are now produced at a comparatively rapid rate by use of the copper bath and a dynamo machine. We know of no other similar application of the electrotype process to the production of mechanical apparatus.

---

A gentleman who was caught lately by the enlargement-for-nothing dodge, which has recently met with such ruthless exposure, and who forwarded a sovereign for the handsome frame required for the work of art, recounts his experiences in a provincial journal. He plaintively says that he submitted both portrait and frame to the unbiassed opinion of one or two artistic friends, and that, after mature consideration, and after turning the portrait upside down, right-way-up, and sideways, so as to give it full advantage of varied positions, these judges came to the conclusion that there was nothing for it but to burn the dreadful thing to ashes, and it was then and there put behind the fire.

---

It would seem that, occasionally, photography throws too much light upon astronomical observations; that is to say, it discloses the apparent existence of phenomena which might be misleading. Fortunately, there are so many astronomers working with photography in different parts of the world, that any mechanical error which has been set down as referring to some variation in the celestial body observed is readily detected. A case in point was brought before the notice of the Royal Astronomical Society at its last meeting. Some time ago Mr. Fowler, of the Observatory of the Royal College of Science, South Kensington, thought he had discovered spectroscropic evidence of the duplicity of *a* Lyræ, and a paper was read on the subject at the Society by Prof. Lockyer. It now turns out that, whatever may have been the cause of the doubling of this particular star, the cause is not to be found in the star itself. Prof. F. C. Vogel, of Potsdam Observatory, has taken eleven photographs of the spectrum of *a* Lyræ since 1888, and in all these photographs the lines were perfectly sharp. Some of these photographs had been exposed during a period of forty minutes or more, and, if the observations at South Kensington had been correct, the changing separation of the lines during the period of the exposures ought to have caused them to appear blurred and confused, whereas they were perfectly sharp.

---

Mr. Ranyard also brought forward evidence derived from an examination of photographs of the spectrum of *a* Lyræ taken by the Bros. Henry, and had found the lines single and perfectly sharp. Mr. Ranyard suggested that the duplicity in the lines of the South Kensington photographs might be caused by the pinching of the prism in front of the object glass by a screw, which, if the strain were sufficient, would give rise to very sensible double refraction. Mr. Fowler, while admitting that, in the face of the facts brought forward, *a* Lyræ could not be a double star, thought it was impossible that there could be sufficient strain ever put upon the prism at South Kensington to give rise to the double refraction Mr. Ranyard had suggested. It now remains for the South Kensington astronomers to find out the reason of the apparent doubling in the photographs.

---

The ordinary journalist, in writing upon photographic subjects, is, for want of knowledge, not very exact in terms, and hence unintentionally falls into blunders. For instance, we read in a contemporary that "the January number of *The Chase* contains another experiment in photographing in colours." If this were really so, the wished for perfecting of a most important problem might have been reached. Of course, what the journalist meant to say was that the picture in question was a reproduction in colours from a photograph.

---

The National Portrait Gallery is to be utilised at last, but in a way which will surprise most photographers. Green's "Short History of the English People" is to be issued in monthly parts, and a well-known engraver has been commissioned to make woodcuts of the National Portrait Gallery pictures, a task which will take three years at the least. How is it that these pictures cannot be photographed? The time of photographing and preparing blocks, would be at least half that required by the engraver, the cost would be less, and of the accuracy there could be no doubt. Are there any regulations which prohibit these pictures being photographed?

## FERROUS OXALATE DEVELOPMENT AND SOME MODIFICATIONS.

In our notice of Dr. Liesegang's annual on page 32 we remarked upon a statement calculated to create some surprise amongst English readers, to the effect that the result of a canvas amongst German professional photographers showed the users of ferrous oxalate as a developer to be as five to one in proportion to those who employ pyrogallic acid for that purpose. The work of the Germans is by no means behind, and, with a view of placing before our readers the most recent review of the subject, we subjoin the following, taken from an article by E. Kiewning on "The Ferrous Oxalate Developer and its Variations," in Dr. Liesegang's Almanac.

"The very valuable enquiry set on foot by the editor of the *Photographisches Archiv*, 'Which kind of development is employed in the most important photographic establishments?' has resulted in the surprising information that, for the most part, practical photographers still give the preference to the oxalate developer.

"Other developers, of which hydrokinone stands in the first rank, are, on account of their peculiar adaptibility for certain cases, not to be condemned. Hydrokinone, particularly for instantaneous exposures, and for landscape purposes, renders most important services, concerning which I shall have something to say on another occasion; but none of the known developers permits of such manifold applications as the ferrous oxalate, and this on account of the variations that may be made in it, variations that with other developers are simply impossible.

"It is not only that with the accustomed and well-known formula of normal proportions it works brilliantly, but we have at hand a modification by adding more or less of the iron solution, either in the first instance, or in the course of development.

"Another variation is the preliminary bath. It is well-known what can be accomplished by the use of a preliminary bath, especially with plates of certain make, and having regard to certain conditions, conditions which I have indicated in a previous article in the *Photographisches Archiv*, 1889, p. 197.

"A further variation is a bath with oxalate of potash, and a small addition of hyposulphite of soda, followed by an addition of iron solution, which, under certain circumstances, yields a very brilliant result.

"For subjects of very great contrast, in which very bright lights as well as deep, heavy shadows have to be photographed, the oxalate developer is capable of rendering most valuable service, as I have mentioned in a communication to the Berlin Society of Photographic Operators, and particularly when used in the following manner, as I have often experienced.

"The plate is first immersed in a solution of iron and hyposulphite of soda, and then, this solution being poured off, it is followed by one of simple oxalate of potash, and the development thus effected. It is astonishing what this variation of the developer permits us to accomplish in the cases mentioned, whether, say, in landscape photography, we take the case where light buildings in a dazzling illumination have to be photographed along with large masses of deep green foliage; or in portraiture, where a lady in white dress is photographed with a gentleman clothed in black. Another case is that of what is called artistic lighting effect, when, for instance, a person at a window in direct sunlight is photographed from within the apartment. Here the apparatus, contrary to all the customary proceedings, is directed almost to the light itself. The method of development just described may be employed with the happiest results.

"To go more into detail. Prepare a solution of hyposulphite of soda of 2 per cent., and of this add according to the requirements of the case—say, for a plate of cabinet size—5, 6, or up to 10 drops to each 50 c.cm. (about $1\frac{3}{4}$ ounces) of iron solution. The proportion of hypo in this preliminary bath is about 1 in 2,000 to 2,500. The plate is immersed in this solution for from one to two minutes, and the solution is then poured off and preserved for further use, and the oxalate solution is poured on. If with this treatment the contrasts appear too weak, a small quantity of fresh iron solution may be added, and a very considerable amount of vigour be thereby gained.

"Another important advantage of the oxalate developer is that the gelatine film becomes tanned, so that, for the purpose of obtaining the utmost sensitiveness, and of work of which the plate is susceptible, it will bear to be warmed to a considerable degree without danger of losing the film during development. This is an advantage of less consequence in summer-time, but in winter is of great importance, for the sensitiveness and softness of the negative are enhanced to a great extent thereby. I have, in this way, taken instantaneous flash-light pictures on plates that were by no means particularly sensitive, using the hypo preliminary bath at a temperature of 18° to 20° Reaumur (72° to 77° Fahrenheit), and an oxalate developer warmed to 30°, 35°, and even 40° Reaumur (100° to 122° Fahrenheit) with the most gratifying results.

"With alkaline developers, whether pyrogallic, hydrokinone, or eikonogen, the temperature of 18°, or at the highest 20° Reaumur, can be exceeded only with the greatest caution, if the danger of frilling or losing the film is not to be incurred.

"The oxalate developer has the advantage, seen especially in portrait photography, over all alkaline developers, of giving greater harmony in the gradation of tone. Whoever is sensitive in this regard will, on comparison, soon find the difference. In this, as in all other matters, Prove all things, and hold fast to that which is best."

Leeds Photographic Society.—*Syllabus of meetings for February.* February 5th, "A Good and Bad Photograph," with lantern and other illustrations, Mr. C. H. Bothamley, F.I.C.; February 16th, "Development," Mr. S. A. Warburton; February 26th, Exhibition of Lantern Slides.

A Dangerous Flash-Light.—"Run! the building is falling!" This cry came from the throats of a thousand people standing near the City Hall at 9.45 last evening. There had just been a heavy explosion, and a great stone had fallen from the roof. Both were the result of an effort to photograph the new Pulitzer building. On the roof had gathered six young men, preparing to take an instantaneous picture. One of the men dropped a spark from a blazing match into a box of magnesium or flash-light powder. The report that followed exceeded anything they had dreamed of. It could be heard a long distance, and the big building was rocked to its base by the explosion. The six men on the roof were thrown flat on their backs, and a three hundred pound coping stone went crashing down to the pavement below. When the people had calmed down they went round to learn what damage had been done. They discovered that about every window pane on the east side of the hall had been broken, but otherwise no damage had been done, so far as could be learned. A lot of small stones were also thrown from the roof, and these struck a good many people, but no one was seriously hurt.—*The Brooklyn Journal.*

## Literary Notices.

Fotografisk Tidskrifts Arsbok, 1890. Edited by Albin Roosval. (*Stockholm: R. Blaedel & Co.*)

A year-book for 1890 of the *Photographic Journal*, published at Stockholm, has lately appeared under the able direction of Albin Roosval, illustrated by nine artistic supplements. The editor confesses in his preface his indebtedness for this idea of a photographic annual, in which his readers are presented with a practical book of photographic reference, to a foreign example and an alien lead. He trusts—he tells us—that his little volume will touch some responsive chord of interest in both amateur and professional, and that when his next yearly issue appears, it will be looked upon already as an old and familiar friend.

The year-book contains some forty or fifty articles of original contribution by authors of distinguished merit. Among the principal of these are "Photographic Discoveries of Unseen Stars," by the Professor of Astronomy in the Upsala University, N. C. Duner; "The Lighting of the Studio," by J. Petersen, the editor of the leading photographic journal in Copenhagen; "The Methods of Photographic Reproduction," by A. Börtzell; "Photographic Economy," by Im. Mohr; "Micro-photography," by A. Smitt; "Stereoscopic Pictures," by Peter Knudsen; and "A New Technical Principle in Lithography," by Lars Ostlin.

The year-book contains also a list of amateur photographers and of amateur photographic clubs in Helsingfors, in Finland; a notice of the photographic societies in Christiania, Copenhagen, Stockholm, Upsala, and Göteborg; tables of English weights and measures, a droptable after Eder, a list of abbreviations commonly employed in photographic chemistry, original receipts, and much other varied information likely to be useful to the photographic student.

Among the illustrations of the year-book are autotypes from the studios of W. Silfversparre, of Norrlandsgatan, and J. Cederquist, of Barnhusgatan, Stockholm, of C. Angerer and Göschl, in Vienna, and of W. Cronenberg, in Grönenbach; phototypes from V. Wolfenstein, of Stockholm, and Sinsel Dorn and Co., of Leipzig, and pictures on aristotype paper from Christensen and Lörensen, of Silkeborg.

The frontispiece, from the lithographic establishment of Stockholm, is a phototype from a negative after nature by Gösta Florman on magneta paper. Silfversparre's autotype of a girl, nude to the waist, bearing a pitcher, is taken from a photograph of the Photographic Society of Berlin, and is a reproduction of M. Nonnenbruch's picture, "The Greek Water Carrier." M. Sinsel Dorn & Co's. illustration of a group of poor children is, perhaps, the most characteristic picture in the annual; the negative was taken on kodak film by G. Kallstenius. V. Wolfenstein has contributed a so-called duplex portrait of himself and Hr. Knut Ahnlöf in a *tête à tête* conversation, taken by handpress from a negative after nature. A scene from Sachs-Meiningen is contributed by the pupils of W. Cronenberg. Photographs of oil paintings have supplied J. Cederquist with two excellent autotypes, one from J. v. Holst's well-known picture entitled "Det Nappar," or "The Nibble," in which the expression of eager curiosity of the two dogs in the fishing boat has been ably reproduced; the other a contribution from the Lurlei motive of C. v. Bodenhausen.

Angerer and Goschl's autotype, which modestly occupies the last place among the illustrations of the year-book, is a reproduction after a negative of an amateur, Prof. Carl Curman, one of the members of the Swedish Photographic Union. The gentleman who holds a paper in his hand, and contemplates the observer with a benevolent smile, situated in a seemingly well-ventilated conservatory, is, we are informed, the political poet, Björnsterne Björnson. We have no space to notice the literary merits of some of the articles. We trust we have said enough to show that this new Swedish year-book is an useful and entertaining contribution to photographic literature.

---

Photography as a Business. By H. P. Robinson. (*London*, 1890: *Percy Lund & Co.*)

This book is upon a subject with which Mr. H. P. Robinson is highly competent to deal, and it contains plenty of useful practical information for those in the trade.

About the "amateur question" Mr. Robinson says:—

The amateur may surreptitiously sell a few prints; he may even commit the enormity of giving some away; he may help the cause of charity by photographing the curate for a bazaar; and the profits of the patronage he bestows on the professional may not be so colossal as he supposes, but none of these errors are criminal. The real mistake he makes and mischief he commits is in becoming a professional, and, with few qualifications for the business, increasing the crowd. He begins by buying a cheap set, and after a few months' practice produces a few prints, which too partial friends unduly praise, and thinks he is fitted to become a full-blown professional photographer. He has probably a little capital, and—to find an easy and agreeable solution to the ever-pressing question of a career—buys a business or builds a studio, and then, and not till then, he finds that the ability to take a portrait—I will go further, and say a good portrait—is but a minor part of a business for the proper prosecution of which he should have had years of training. If there is something exceptional in him he struggles through, but if he is less than exceptional he waits until his capital is exhausted, and then subsides into another line in life, or becomes an assistant, when, probably, his real education begins.

I may be answered that I am exaggerating the failures; that the *Gazette* shows very few bankruptcies which would happen if so great a number failed. One easy reply is that photographers, not keeping stock, are seldom sufficiently in debt to make bankruptcy worth while; another is that, as a body, they are so seldom trusted as to have little chance of getting into debt.

---

Received.—J. H. Steward's catalogue of magic lanterns, dissolving views and effects. It is handsomely bound, well illustrated, and most conveniently arranged for reference.——From R. Morgan, Norwood, "The British Weather Chart, 1891," by B. J. Jenkins, F.R.A.S. The chart is stated to be based on the author's paper on "Forecasting the Weather," in the Bulletin of the Royal Academy of Sciences of Belgium. The chart is accompanied with letter-press explanation and predictions of probable weather during the twelve months of the year.——From E. L. Wilson, New York, *Photographic Mosaics for* 1891, "its twenty-seventh appearance, swollen to twice its former girth," says the preface. It contains several full-page engravings, the frontispiece being a portrait of the veteran actor and artist, Joseph Jefferson. The price of this annual is just double that of the Year-Book.——From Taylor, Taylor, and Hobson (London office, 6, Southampton Street, High Holborn), Price List of Photographic Lenses. It contains, in addition to commercial announcements, advice on "Choosing a Lens," and an essay on "The Principles of a Lens' Action."——From Sampson Low, Marston, and Co., "Bibliotheca Polytechnica"; a directory of technical literature, in which the catch-words are given in English, French, and German. An enumeration of the technical journals in these three languages is also given. It is edited by Fritz von Szczepanski.

## PHOTOGRAPHING THE DEAD.

THE following particulars are from a recent number of *The New York Sun*:—

For many years the city has had photographs taken of most of the dead bodies which have been brought to the Morgue and not identified by friends or relatives within two or three days after reception. The object of this is evident. A record of the appearance of the unknown dead is thus preserved on a single sheet of paper, which is infinitely more serviceable than verbal descriptions, which might fill a volume. These records in silver and sunlight have, in hundreds of instances, led to the identification of the dead long after burial—in some cases months and years afterwards. Besides, when a photograph of an unidentified body has been secured, the body can be buried in the Potter's Field on Hart's Island without delay. The system is rendered practically perfect by New York's method of burial in the Potter's Field. A body buried there any time within the past twenty years can be recovered with certainty and without trouble.

A few months ago a man called at the office of the Department of Charities and Correction at Third Avenue and Eleventh Street, and asked to see President Porter. He exhibited several photographs of persons taken after death. The workmanship was excellent. The man explained that he was a photographer, and had frequently been called upon by families to make pictures of their dead. His success with the work had suggested to him that he make it a specialty. He has done so, and now, after several years of experimenting, he considered himself an expert. Mr. Porter examined the portraits, and pronounced them first-class. The man then made a formal application for the work of photographing the dead of the city Morgue.

"Do you know what we pay for that work?" asked Mr. Porter.

"Yes," said the photographer, "you pay five dollars for each photograph."

"That is so," said Mr. Porter, "but do you know how much it all amounts to in the course of the year?"

"I do not," replied the photographer; "but I do know that your present photographer, Oscar G. Mason, manages to live in pretty good style, and does not have to do outside work."

"Would it surprise you to know," asked Mr. Porter pointedly, "that Mr. Mason's work costs the city between $400 and $600 a year?"

The photographer whistled softly, and was silent. Then he said that the business was very much smaller than he had supposed, but that still, at the rate of five dollars a photograph, it was well worth the doing. He said he was disappointed in the prospect, but that, nevertheless, he would press his application, and, if successful in getting the work, he would run the Morgue work in along with his outside business, and in that way make it profitable.

"Very well," said Mr. Porter, "but before you commit yourself, I will give you a few facts about Mr. Mason and his work. You evidently do not know that photographing occasional dead bodies at five dollars each is not a tithe of the work that Mr. Mason does for us, yet it is the only work for which he gets any pay whatever. The great bulk of his time is devoted to photographing cases of disease and deformity in the hospital, surgical operations of an exceptional nature, and miscellaneous operations in various stages intended to serve as pictorial histories of the advance of surgery, and as models for the instruction of students, young physicians, and inexperienced surgeons. This high-class scientific work he throws in for nothing, contenting himself with the scanty income which comes from the occasional jobs in the Morgue, and ——."

"But," interrupted the photographer, reaching for his hat, "why on earth does he do all that for nothing? That is high-class work. Is not the city willing to pay him for it?"

"We have frequently offered to pay him for his very valuable medical and surgical photography," said Mr. Porter, "but he positively refuses any compensation except for the unpleasant work of photographing eighty or a hundred Morgue cases a year. He persists in this course, notwithstanding that he devotes almost his entire time to department work, and is always ready and willing to sacrifice any outside interests to do us a service. But, to come down to the question before us, if you seriously want to undertake all of Mr. Mason's work upon his terms, you may leave your application with the Commissioners, and we will consider whether it is to the interests of the city and of Bellevue Hospital to substitute you for Mr. Mason as the department photographer."

The photographer arose. He said simply that he withdrew his application. Then he put on his hat and left the building. He is not the only one who has applied for Mr. Mason's job. Within the last two or three years, particularly, there have been many applications for the work of photographing the city's unknown dead; but every applicant has heard the same story about the city's photographer, and, upon hearing it, has reached for his hat and abruptly left the room.

## ASTRONOMICAL TELESCOPES.*

BY A. A. COMMON, F.R.S., TREASURER TO THE ROYAL ASTRONOMICAL SOCIETY.

THE mounting of the reflector has been treated, if not so successfully, with more variety than in the case of the refractor, as we shall see from the pictures I will show you, especially where the Newtonian form is used. The 4-foot reflector at Melbourne is mounted on the German plan, in a similar way to a refractor, and an almost identical plan has been followed by the makers of the 4-foot at the Paris Observatory. Lassell, who was the first to mount a large reflector equatorially, used a mounting that may be called the forked mounting, the polar axis being forked at its upper end, and the tube of the telescope swinging between the forks; a very excellent plan, dispensing with all counterpoising. Wishing to obtain certain conditions that I thought—and think now—favourable to the performance of the reflector, I devised a mounting where the whole tube was supported at one end on a bent arm; a 3-foot mirror was mounted on this plan in 1879, and worked admirably. The Newtonian form demands the presence of the observer near the high end of the telescope, and the trouble of getting him there and keeping him safely close to the eye-piece is very great. As we see from the various photographs, several means have been employed to do this, none of them quite satisfactory.

All the refracting telescopes of note in the world are covered by domes that effectually protect them from the weather; these domes are in some cases comparable in cost with the instruments they cover. It is not surprising, therefore, that efforts have been made to devise a means of getting rid of this costly dome and the long movable tube.

It was suggested many years ago that a combination of plane mirrors could be used to direct light from any object into a fixed telescope. This idea in a modified form has often been used for special work, one plane mirror being used, as we see in the picture on the screen, to throw a beam of light into a telescope fixed horizontally; for certain kinds of work this does admirably, but the range is restricted, as can be easily seen, and the object rotates in the field of view as the earth goes round. The next step would be to place the telescope pointing parallel to the axis of the earth, and send the beam of light into it from the mirror, which could now be carried by the tube, so that by simply rotating the tube on its own

* Continued from p. 51.

axis the object would be kept in the field of view. Sir Howard Grubb makes a small telescope on this plan, and some years ago proposed a somewhat similar plan. A sketch of this plan I will show you. You will see, however, that here again the range is restricted, and to use the telescope, means would be required to constantly vary the inclination of the small mirror at one-half the rate of inclination of the short tube carrying the object-glass.

By the use of two plane mirrors, however, the solution of the problem of a rotating telescope tube placed as a polar axis is solved. By having such a telescope with a plane mirror at an angle of 45° to the axis of the telescope in front of the object-glass, we can, by simply rotating the telescope, see every object lying on the equator; and by adding another similar plane mirror at an angle of 45° to the axis of the telescope, *as bent out at right angles by the first plane mirror*, and giving the mirror a rotation perpendicular to this axis, we obtain the same power of pointing the telescope as we have in the equatorial. The idea of doing this was published many years ago, but it was left to the skill and perseverance of M. Lœwy, of the Paris Observatory, to put it into practical use. He devised, and had made, a telescope on this principle, of 10½ inches aperture, which was completed in 1882. It has proved itself an unqualified success, and many other larger ones are now being made in Paris, including one of twenty-three inches aperture, now nearly completed, for the Paris Observatory.

A lantern copy of a drawing of this latter telescope will be thrown on the screen, in order that you may see what manifest advantages exist in this form of telescope. There is but one objection that can be urged—that is, the possible damage to the definition by the plane mirrors; but this seems, from what I have seen of the wonderful perfection of the plane mirrors made by the Brothers Henry, to be an unreasonable one—at any rate, not an insurmountable one. In every other respect, except perhaps, a slight loss of light, this form of telescope is so manifestly superior to the ordinary form, that it must supersede it in time, not only for general work, but for such work as photography and spectroscopy.

*(To be continued.)*

THE MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.—A photographic exhibition in connection with this Society will be held at the Manchester Athenæum (George Street entrance), on Monday, Tuesday, and Wednesday, February 9th, 10th, and 11th, 1891. Open Monday, 6 to 10 p.m.; Tuesday and Wednesday, 10 a.m. to 10 p.m.

POPULAR AFTERNOON LECTURES.—The Council of the Society of Arts have arranged for a course of five popular lectures to be given by Captain W. de W. Abney, on the following afternoons, at half-past four o'clock—February 13th, 20th, 27th, March 6th, 13th. The subject will be "The Science of Colour." The lectures will be of a popular and elementary character, and will be fully illustrated by experiments. The regulations for admission will be the same as for the Cantor Lectures, each member having the privilege of admitting one friend.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.—The first annual general meeting of this Association will be held, as announced elsewhere, at the Colonnade Hotel, Birmingham, on the 12th of February, for the enrolment of members, election of officers, and the discussion of rules drawn up by the Provisional Committee. In order to facilitate arrangements for adequate accommodation, those who intend to be present are requested to send an intimation on or before February 11th to Mr. H. J. Whitlock, New Street, Birmingham.

# Patent Intelligence.



## Applications for Letters Patent.

911. J. PRESTWICH and W. H. PRESTWICH, Warmington House, Tottenham, "Gas or Oil Stove."—January 19th.

998. C. HODDLE, 164, Camberwell New Road, London, "Metallic Printing Frame."—January 20th.

1,055. T. R. DALLMEYER, 115, Cannon Street, London, "Optical Projections of Photographs in Natural Colours."—January 21st.

1,080. R. SCHREINER, 8, Quality Court, London, "Changing Boxes."—January 21st.

1,101. G. F. FORSTER, 24, Compton Terrace, Islington, London, "Double Front Combination for the Magic Lantern."—January 21st.

1,130. J. H. NESTLER, 23, Chancery Lane, London, "Hand-Camera."—January 21st.

1,140. J. ARMISTEAD and F. T. CLARK, "Lantern for Dark Room."—January 21st.

1,187. C. BECK, 23, Southampton Buildings, London, "Cameras." January 21st.

## Specifications Published.

669. *January 14th*, 1890.—"Ascertaining the Requisite Time of Exposure in Photography." EDWARD GEORGE BALLARD, 1, Eversley Park, Chester, H.M. Inspector of Alkali Works.

A ready method of measuring the amount of actinic rays proceeding from any landscape or object has for a long time been a thing much desired by photographers, both amateur and professional. Many instruments with this view have been from time to time brought out, but none of them have proved very satisfactory. The same may be said of tables, which, although of great assistance in open landscape, have this drawback, that, wherever the quality of the light is interfered with, that is, in forest scenery, deep glens with overhanging trees where the very air appears to be green, interiors of churches, *etcetera*, where the light which enters perhaps passes through coloured glass, and so forth, you are compelled to guess at the exposure after all.

The apparatus about to be described purposes not only to measure the intensity of the rays of light proceeding from any object, but also the quality of the same.

The principle upon which the instrument is constructed is based upon (1) that luminous calcium sulphide or Balmain's luminous paint is only excited by those rays of light which usually act upon the photographic plate; (2) that when luminous paint is excited by exposure to light, either daylight or other white light, such as a burning piece of magnesium wire, and the source of light is suddenly removed, it will be observed that the bluish light emitted from the luminous paint gradually fades. The rate and manner in which this fading occurs are employed by me in this invention as a means for ascertaining the intensity of the light proceeding from any object, landscape, or sea view.

This is arrived at by noting the time required for the luminous paint to acquire the same degree of intensity as a portion of the light proceeding from the object, landscape, or sea view in question, and referring to a table specially constructed for that purpose.

In carrying out my invention into practice, one form of apparatus which I have found very successful is as follows, and is given by way of illustration only:—

A wooden or other opaque tube, coloured dull black inside, and open at both ends, and of convenient size and shape at one end to adjust to the eye, is provided at the other end with a second and similar but shorter tube hinged to it, so as to form a lid. This lid is glazed next the tube with blue glass capable of cutting off all rays except those corresponding with those which proceed from the luminous paint. A second glass is slipped into this, coated as regards about half its area with an opaque layer of calcium sulphide paint (Balmain's luminous paint); above this a number of layers of tissue paper or other uniform translucent material is placed, and a covering is added of ordinary or cobalt blue glass. The number of sheets of tissue paper to be inserted is found by experiment for each variety of dry plates. Their use is to lessen the intensity of light passing through to the degree requisite to give correct results with the instrument; this once found is constant for that variety of plate.

To use the instrument, allow the hinged portion to fall, and so get the side with the luminous paint fully exposed to daylight for thirty seconds. Place the eye at the end, then quickly close the hinged portion; a blue luminous ground and a dark ground will be seen side by side. Count the number of seconds it takes for the blue luminous side to acquire the same tint as the dark side—that is, note when the difference in blue disappears. Refer to the table mentioned, and, opposite the number of seconds required for the two halves to appear alike, will be found the correct exposure to be given to the photographic plate to which the instrument is adjusted.

The instrument I have constructed is adjusted to a plate of about 18 Warnerke sensitometer value, working with a stop or diaphragm in the lens of one-sixteenth of the focus of the same.

The actinometer can easily be adjusted to a plate of any degree of speed by removing or adding to the layers of tissue paper behind the glass carrying the luminous paint.

In adjusting the actinometer, any of the published tables of exposure may be employed, or, better still, that excellent little calculating machine for photographic exposures called the "actinograph," invented, after much labour and study, by Dr. Ferdinand Hurter and Mr. Driffield, of Widnes. Or in very perfect instruments a clockwork, or its equivalent, can be set in action by closing the hinged portion, and arrested by opening it; this can be arranged with a scale to show the requisite exposure in seconds.

2,671. *February 19th*, 1890.—"The Photometric Examination of Gases." WILLIAM FOSTER, 14, Clement's Inn, London, Consulting Chemist.

My invention consists of apparatus whereby the illuminating value of one and the same sample of gas can be rapidly ascertained when consumed in a number of different burners.

It consists of a tap or cock the plug of which is fixed. A channel or passage for the gas is made along a portion of the longitudinal axis of the plug terminating laterally.

Encircling the plug is a mass of metal carrying arms of equal length, at the end of each arm a particular but different burner being arranged. These arms, with the burners which they carry, rotate round the central fixed plug.

In using the apparatus a particular burner is brought round to the end of the bar of the photometer, whereby the lateral channel in the plug, the arm of the burner required, and the bar of the photometer are all three in the same straight line. All the other arms, and, therefore, all the other burners of the apparatus, are cut off from gas communication. When flat flame burners are used, I arrange a form of tap at the extremity of the radial arm, whereby the flat surface or the edge of the flame can be opposite to the disc of the photometer.

9,422. *June 18th*, 1890.—"Glazing Bars or Astragals for Roof-lights." WILLIAM RICHARD LESTER, 11, West Regent Street, Glasgow, Engineer.

My said invention has for its object to improve the form of glazing bars or astragals for roof-lights or windows, and to combine parts so that a soft material, such as lead, or an alloy thereof, may be satisfactorily used for securing the glass. Zinc, or other metals, or alloys, may also be used in combination with my improved bars.

In carrying out my invention according to one modification, I employ a steel or iron bar rolled so as to be of a section having an upper vertical member or web, and on each side of its lower part a member or web shaped to form a gutter. In addition, there is formed on each side of the middle part a shoulder or projection, on which the edge of the glass is to rest. But these shoulders are a little higher than the outer edges of the gutter parts, so that such outer edges do not touch the underside of the glass. The lead or other metal combined with the bar is made to cover the vertical member, and is riveted thereto, or otherwise attached, so that it cannot lift off the bar; and it is made with marginal parts, which are doubled close down to the shoulders, and which are folded down on the glass when it has been placed in position.

The vertical member of the bar may be made to extend in part above, and in part below the other parts. An inner gutter may be formed on each side, and so as to have the glass resting on its outer edge, but not on the outer edge of the outer gutter, by suitably doubling and bending the lead, the shoulders below the lead being relatively lower than in the first modification; or inner gutters may be formed by fixing suitably shaped strips of zinc or other metal to the bar.

In other modifications, the bar may be of cast iron or other suitable material; or it may be of wood, in which last case the parts are made of such dimensions as to be of sufficient strength; or the bar may be made of sheet metal bended so as to present an outward form like what is hereinbefore described for the steel or iron bar, wood or other suitable material being in some cases combined with such sheet metal.

19,658. *December 2nd*, 1890.—"Photographic Films." A communication from GEORGE EASTMAN, Rochester, County of Monro, State of New York, United States of America, Manufacturer. ALFRED JULIUS BOULT, 323, High Holborn, London.

Difficulty has heretofore been found in using photographic film—such, for instance, as is described in letters patent No. 19,897, dated December 10th, 1889, granted to me—composed of a film support made from a compound of nitro-cellulose camphor and other substances, and having applied thereto, after being dried, a film or layer of gelatino-argentic emulsion, especially if the photographic film be wide, owing to the tendency of such film to contract at the edges more than the central parts, so that it will not lie flat on the table or support of the roll-holder—such, for instance, as that of the Eastman and Walker roll-holder—but, when strained tight, the edges alone will be brought in contact with the table, while the central parts will bulge and buckle, thereby rendering it objectionable or unsuitable for photographic purposes. This unequal contraction and buckling is believed to be due to the drying out or evaporation of the volatile substance or substances used with the nitro-cellulose to make the compound from which the film support is produced, and which remain in it after it is dried. One reason for this belief is that it has been observed that such photographic film that has been kept on spools for some time becomes permanently set, and the buckling is more marked.

It has been discovered that, by coating and thus protecting or sealing the film support on both of its surfaces with some material such as gelatine—which, it is believed, prevents, retards, or modifies the evaporation of said substance or substances in the film support when dried—the film is prevented from unequally contracting or buckling to an objectionable extent, and is caused to remain in good condition, and so that it may be kept in rolls or on spools for a considerable period of time without materially changing, thus enabling it to be employed in all cases where paper films are used.

THE ROYAL INSTITUTION.—Lord Rayleigh's lecture on "Some Applications of Photography" did not come off last Friday, and we regret to say that it was in consequence of domestic affliction; its delivery has been postponed. In place thereof, Lord Justice Sir Edward Fry lectured on "British Mosses." Among the objects of interest exhibited in the library, were small photographs on Dagron and Co's. collodion films, illustrating the French pigeon post, by Mr. John Spiller; an excellent winter scene in the mountains, Piz Langard, Engandine, by Mr. Arnold Spiller; some good primuline prints by Messrs. Green, Cross, and Bevan; seascapes by G. West and Sons; views of the moon by F. S. Wells; camera with aluminium fittings by J. R. Gotz; opthalmic refractometer by A. Fournet; a "terpuescope" by A. Wrench; exposure meter by Mr. Watkins; Gravell's optical pointer, and his adjustable cut-off for limelight jets; Newton's new projection lantern for the Royal Institution; a table polariscope by Harvey and Peak; and photogravures by the Typographic Etching Co.

## Correspondence.

### DR. EMERSON'S RENUNCIATION.

Sir,—Can it be true, or is Dr. Emerson playing off a joke on us? It seems too good news for actuality that the prime instigator of the naturalistic racket has at last felt the error of his ways. If he means it to be a reality, he must earn by it the goodwill and thanks of all who truly desire the advance of pictorial photography. It is easy to understand how a cultured gentleman must be annoyed by the sickly manner in which those who have supported his former views have "out-Heroded Herod" with their long rigmaroles of meaningless *palabras*, which must leave even the most highly-versed students of modern critics' slang in perfect dismay in endeavouring to discover what these paper stainers are driving at.

Probably they do not themselves know, and, on the principle that "fine feathers make fine birds," sought, by the involved mysticism of their phraseology, to imbue the less intellectual of their hearers or readers with the idea that anything couched in such far-fetched terms necessarily contained considerable elements of nobility.

In his detail of the causes to which Dr. Emerson attributes his conversion there is nothing new to sensible men, but it appears to me strange that he should so long have overlooked these matters, which are common experience.

I venture to differ with Dr. Emerson on the final cause which seems to have determined his bravely offered renunciation. I do not think it is to be attributed to his examination of various studies in art *after* three and a-half months' solitary study of nature in his house-boat. I think, if he fairly analyses his inward reflections, he will find that his change of views rather results from the mentioned three and a-half months' study of nature away from access to art examples. He has at last appreciated what nature is, and how far away anything yet offered as art is from compared with it, and how infinitely farther still from it is anything emanating from the naturalistic schoolroom. He is the better artist for his unconscious training, for one who can produce the frontispiece to "Wild Life on a Tidal River" presents to his admirers a work which, in artistic value, is far ahead of the majority of those issuing from the studios of to-day.

All lovers of art photography must be delighted to find how Dr. Emerson throws off those who have striven to render themselves illustrious by clinging to his coat-tails; it really seems as though he had been for some years piling up a big joke on them previous to depositing them very carefully in the mire. Anyhow, as Wilkis declared he "never was a Wilkite," we have now Dr. Emerson's virtual declaration that he does not belong to the Emersonian school. Henry E. Davis.

28, *Leinster Square, Bayswater, London, W., Jan. 26th.*

---

Sir,—The fever of excitement caused by the news embodied in Dr. Emerson's essay of last week has probably by this subsided, and the manufacture of soft soap by the enemy commenced. If the word enemy applies to one who differed from Dr. Emerson on the question of naturalistic photography, it will not be surprising if a little glee, "small-souled" or otherwise, be forthcoming. Be this as it may, most questions, like tombstones, have two sides, and the epitaph of last week seems to be the one side, of which the following may be the other:— "Here lies a veritable bone of contention, being all that remains of an attempt to theorise. Born prematurely, and nourished insufficiently, it crawled through a short and chequered career, admired by few, derided by many, and dying very little lamented; the spirit of which, freed from personal ambition, may yet rise to honour and stability." This, I fancy, will embody rather more of the public opinion than that of last week.

Most people have heard the fable of the boy who called "Wolf!" until he fell a victim to that complaint. Dr. Emerson had probably forgotten it when he mentioned his intention of reconsidering the matter, and then calling for help.

In concluding, I cannot think of a more apt quotation than Dr. Emerson's own from Francis Bacon, "If offence come out of truth, it were better the offence come than the truth be concealed." H. Colebrook.

## Proceedings of Societies.

### The Photographic Society of Great Britain.

At the technical meeting of this Society held on Tuesday evening, the 27th inst., the chair was occupied by Mr. H. Chapman Jones.

The Chairman handed round for inspection a Wray's lens for detective camera work. It was of six-inch focus, constructed with Jena glass, and furnished with an iris diaphragm and index.

Mr. A. Cowan thought it better that there should be a click indicating when the aperture stood at the standard sizes marked on the index.

Mr. G. L. Addenbrooke would like to hear the experience of any who had worked with combination sets of lenses. A set of that kind which he possessed was not very successful, the illumination being unequal, and falling away at the corners.

Mr. Cowan had known Darlot's combination sets to work very well, but they were not intended to be used with large diaphragms.

Mr. Addenbrooke asked whether doublets—one component of which was of longer focus than the other—were not necessarily inferior to symmetrical lenses.

Mr. W. E. Debenham thought not, at all events, for lenses of the wide-angle character.

Mr. W. Bedford had had a set of lenses made for him by Darlot, with a somewhat more extensive range than usual, and found them work very satisfactorily. He did not notice any bad result from the combinations being unsymmetrical, even when using those of longest and shortest focus together.

The Chairman said that aluminium might now be used in these fittings, being so much cheaper than it formerly was.

Mr. Addenbrooke added that, for the last year or more, a good solder for aluminium had been in use. A piece of metal might be soldered with it, and beaten out to double its size without injury.

The Chairman thought it a mistake to use so large a plate as the quarter size when taking negatives for the lantern. If an oblong picture were intended to be made, there was no advantage in going beyond half the quarter-plate size.

Mr. Debenham thought it well to be able to select the portion of the subject to be used at more leisure than was practicable with detective camera subjects. Mr. Thomas Sutton had recommended the general use of a square plate large in proportion to the focus of the lens, so that the best portion of the view could be selected afterwards.

The Chairman said that, with a good finder, there was no difficulty, and he was never more than an eighth of an inch out. Finders, as sold, were often inaccurate.

Mr. W. H. Harrison asked whether there was any advantage in triple over double condensers for lantern slides of ordinary size.

Mr. T. E. Freshwater said that for illuminating a small surface the triple condenser was best, but there was no advantage when showing the whole of a slide of ordinary size.

Mr. Addenbrooke mentioned that an incandescence lamp for use in the lantern had been recently brought out, and asked whether anyone present had had any experience with it.

Mr. Freshwater thought it better to use the arc light when a current was available, but care must be taken not to heat the condenser, and it must be of long focus.

The Chairman remarked that it was generally considered that lantern slides should be very sharply defined. One maker had told him that if the slide appeared sharp to the eye, that would be sufficient. What would be Mr. Debenham's opinion?

Mr. Debenham replied that a three-inch slide, examined at a distance of nine inches, would subtend the same angle as when thrown on a six-foot screen and looked at from a distance of eighteen feet. If there was greater enlargement, or if the spectator were nearer, want of sharpness might be detected on the screen that was noticeable in the slide itself. He would like the slide to be defined as finely as possible, and for the image to bear closer examination on the screen if desired.

At the next technical meeting, in February, views of Australian and American scenery will be shown by Mr. Addenbrooke.

### The Photographic Society of Ireland.

A technical meeting was held at 15, Dawson Street, Dublin, on the 22nd inst., Mr. Herbert Bewley in the chair.

Mr. H. M. Smith, of the Eastman Dry Plate and Film Co., exhibited the various forms of "kodaks," including their new No. 4 folding kodak. He also explained the working of the rollable film, and gave instructions as to the best methods of enlarging on Eastman bromide paper, both by daylight and artificial light. He passed round some very fine enlargements from kodak negatives, and subsequently developed a 15 by 12 bromide print, and stated that the developer *par excellence* for the company's bromide paper was ferrous oxalate.

### The North Middlesex Photographic Society.

*January 26th.* — Mr. Goodhew, vice-president, in the chair.

Mr. G. R. Martin, in opening a discussion on "Halation and Light Fog," said he did not pretend to have more knowledge of these phenomena and their causes than other members of the Society, but proposed to give his opinions for comparison with the experience of others. He had, when the subject was first proposed some time ago, prepared negatives to illustrate his views. These, however, had been destroyed, and as he, most unfortunately, had not had time to repeat them, he would attempt to explain them with the aid of the blackboard. In the first place, he considered that the various kinds of halation and light fog were due to several causes, many or all of which were present at the same time, so that it would be futile to attempt to say to which cause any particular instance was due, and as light fog and halation were usually present at the same time, he proposed to take into consideration all species of fog which were impressed upon the plate during exposure in the camera. Halation in its usual form was a spreading of the high lights into the adjacent shadows, and was generally assumed to proceed from the reflection of these lights from the back of the plate. It had been objected that these rays would be reflected at an angle equal to the angle of their incidence, and so, in many cases, would appear in the form of a second image on one or the other side of the direct image. It was only necessary to remember that the film acted as a disperser of light, causing it to spread in all directions, and, consequently, to be reflected in the same way, to show that this objection was unfounded. The second cause might be attributed to the reflection of small portions of the light in all directions from the crystals of haloid salt in the film. This would probably be small in quantity and entirely on the surface, and could be removed by gentle rubbing with a rag moistened with methylated alcohol. Another cause of fog, when taking a negative with extreme contrasts, was that the light was sometimes reflected from the edges of a badly-finished lens, and even when the lens was perfect, uncondensed light entered and formed a halo on the plate. He then referred to ghost images, and showed by diagrams how they were formed. Prevention.—It had been suggested to back plates with some non-actinic matter, such as stained collodion, gamboge, and gum, or any medium which approached the refraction index of glass. He had in practice found that a piece of the Autotype Company's black film wetted and applied to the back of the plate was as good as any, was easy to apply and remove, and did not in any way injure the plate, even when kept in contact for two or three weeks. It had also been suggested to mask the windows or other brilliant objects with a screen, and either to take two exposures on different plates, giving a long exposure for the shadows with the screen in position, and a short one for the lights with the screen removed, or to combine the two exposures on the one negative. He had not tried this method, but did not doubt that it was practicable in certain cases. He preferred to mask portions of the negative during the process of printing, and referred to successful instances of this method shown by a member of the Society at a previous meeting. It had been proposed to stain the film previous to exposure with a non-actinic colour, but he could not recommend the practice, as the exposure would be immoderately prolonged, or the shadow portions of the negative would be wanting in density. It had also been proposed to stain the film with orthochromatic dye, or to use orthochromatic plates. He failed to see that any advantage would accrue from the use of either. A cause of halation not usually taken note of would be found in the motes of dust floating in front of the brilliant object. These would tend to disperse the light and produce fog. His attention had been called to a theory that, when the haloid salts in the direct line of the light had been reduced, they would absorb bromine from the adjacent crystals, and these in turn from those farther off, thus causing a spreading of the light. He thought it improbable, but understood that the Secretary had tested the theory. (The Secretary said his experiments were not conclusive.) Finally, he believed that the best method of preventing halation at the back of the plate, where it was impossible to remove it, was to use a slow, thickly-covered plate.

The subject led to an animated discussion, in which Mr. Marchant thought the use of a screen in front of church windows could hardly be seriously proposed.

Mr. Beadle had seen it adopted, several men with ladders being employed.

Mr. Cox was of opinion that backing plates was next to useless, but had heard a salesman of celluloid films state at a society meeting that with those which had a matt surface halation was impossible. When the halation was slight it was no more than was palpable to the eyes when viewing a brilliant light crossed by bright lines.

Mr. Mummery referred to the theory of the haloid salts being reduced by the mechanical action of the rapid vibrations of light waves, and thought it possible that the impact might be communicated to the adjacent crystals.

Mr. Beadle had found that ground glass plates and the backing of ordinary plates with Brunswick black mitigated halation. The black might be removed with kerosine. He also deprecated the use of powerful developers when halation was suspected.

Mr. Smith had found so much emulsion on the backs of his plates that he thought it would cost the manufacturers little to cover them entirely, when a piece of paper could easily be brought into optical contact.

Mr. Gill developed his photographs till the high lights were well up, washed them thoroughly, applied vaseline to the parts where development was complete, and then proceeded with the development of the shadows. The vaseline was easily removable from the dried negative with spirit.

Mr. Goodhew thought the amount of halation by reflection of light from the crystals of haloid salts would be but little. He preferred thickly-coated rapid plates for interiors, and had taken negatives in Canterbury Cathedral on them in twenty minutes, and had been little troubled with halations. He also deprecated rapid development, and although the practice had been condemned, he flooded his plates with water, believing that by doing so he obtained requisite density without developing the halated portions at the back of the film. He was of opinion that orthochromatic plates were useful for interiors, as they were super-sensitive to the yellow part of the spectrum, and the use of a coloured screen would hold back the violet and blue rays.

Mr. Martin answered several questions, and received a vote of thanks.

### The West London Photographic Society.

A meeting was held at Broadway Lecture Hall, Hammersmith, on January 23rd; Mr. W. A. Brown (president) in the chair.

The President read a letter from Mr. John A. Hodges, resigning his appointmsnt as Hon. Secretary, on account of ill-health. A cordial vote of sympathy with Mr. Hodges was carried unanimously, and ordered to be entered on the minutes.

The President then announced that the Council had appointed Mr. Harry Selby, 42, Ladbroke Grove Road, W., to the vacant post of Hon. Secretary, subject to confirmation by the members. The appointment was unanimously confirmed. The following appointments were then confirmed :—Mr. Leslie Selby to be Assistant Hon. Secretary, vice Mr. Lionel C. Bennett, who resigned; Mr. L. C. Bennett and Mr. J. Stein, to be Hon. Auditors, vice Messrs. H. and L. Selby, who vacate the posts on their new appointments.

After the PRESIDENT had presented the medals to the successful competitors at the recent Society Exhibition—

Mr. J. MARTIN DICKINS read his papers, "A Suggestion," and "A Photographic Yarn." The "Suggestion" was that papers read before the Society should not be confined entirely to the scientific side of photography, but that, especially when other papers were lacking, proceedings should be made more cordial and less frigid by the relation of photographic adventures and so forth. "A Photographic Yarn" consisted in the relation, in jocular verse, of the adventures of two travellers in Australia, and of their difficulties in loading their slides in the open air after losing their dark tent in a bush fire.

A question was asked in the question-box as to the effect of ammonia fumes on the lungs. There being no medical man present, no professional opinion could be obtained. Mr. C. Whiting mentioned the ammoniaphone in connection with the question.

A second question was asked as to the best toning bath for obtaining sepia tones on sensitised rough drawing paper. Mr. Bennet recommended platinum toning. Mr. Wilson had obtained good results with weak gold and borax. Mr. Hazeon suggested paper toned with a non-acid platinum solution. Mr. C. Whiting expressed doubt as to what was a real sepia tone, remarking that he found black tones easiest to obtain on such paper.

Mr. DIXON exhibited prints on matt-surface paper, and desired hints as to the method of procuring black tones. The general opinion seemed to be that the negatives were too thin for black tones.

Mr. H. SELBY exhibited a negative showing the sun with a distinct solar halo. The exposure was made on January 18th, at 3 p.m., with a quick shutter on a Mawson plate, with lens working at *f* 8.

The PRESIDENT made some remarks on the question of procuring a concession of cheap railway fares for photographers on the same lines as those granted to anglers and others.

Seven new members were proposed for election at the next meeting.

### THE HACKNEY PHOTOGRAPHIC SOCIETY.

SOME American slides were shown before this Society; the audience included a number of ladies.

At the conclusion, slides of members were shown, Messrs. Barton, Gosling, and the secretary contributing, to which were added some Woodbury slides of Niagara.

The SECRETARY announced that at the next meeting Mr. Henry Sturmey would give a lecture on "Norway," illustrated by the lantern.

### THE CROYDON MICROSCOPICAL CLUB.

THE annual meeting was held on January 21st at the Public Hall. In his presidential address, Mr. LOVETT congratulated the Society upon the position of the Club, and the successful year's work. Forty-four new members had joined in twelve months. Fifteen lectures and papers on subjects of general interest had been read during the year, and the meetings and excursions had been well attended. The exhibits at the meetings had also increased, and had given much zest to those gatherings. Mr. Lovett stated that he had succeeded in obtaining a room in the Public Hall, which he had fitted up as a dark-room and laboratory for the photographic section, and which he now desired to present to the Club for the coming year. This room, which is twenty-five feet long, and supplied with water, and warmed and lighted with gas, has a permanent screen fitted at one end, and will be useful alike for enlarging, developing, and general photographic work. The president said that with this room, and its many other advantages, the Club would no doubt increase in members largely during the coming year; the present membership is over three hundred.

Mr. Sturge was elected treasurer in the place of Mr. McKean (resigned), and the two vacancies on committee were filled by Mr. H. D. Gower (hon. secretary) and Mr. McKean.

### THE MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE sixth annual report (1890) of the above Society was read at the annual general meeting, held at the Manchester Athenæum, Princess Street, last Tuesday, and, among other items, set forth that 73 new members have joined the Society since the last annual meeting; 13 members have resigned, and 25 been struck off the books for non-payment of subscriptions; there are now 328 ordinary and 2 honorary members as against 293 last year. The treasurer's account shows a balance of £60 18s. 5d., as against £14 8s. 10d. last year. Since the issue of the fifth annual report, there has been secured on favourable terms a good room on the ground floor of No. 14, Ridgefield, John Dalton Street, Manchester. This room is now being fitted with all requisites, and will, it is hoped, be of much service to members who may desire to make enlargements for the forthcoming annual exhibition. It has been arranged, too, that the Society's library shall be placed in the room, and in order that the books may circulate more readily, it is suggested that the librarian should attend weekly instead of monthly as at present. Lockers will be provided at a small charge for the use of those members who do not happen to have offices in town.

Underneath this enlarging room is a cellar of the same dimensions, and in case of necessity it will at any time be an easy matter to fit up a large number of developing sinks therein. The oil and lime-light lanterns have been lent out 135 times during the year, and the slides belonging to the Society have lost none of their popularity. The Society has purchased a magnificent 10 by 8 camera with lenses and all requisites, and this has been constantly in the hands of one or other of our members, and has given satisfaction.

### THE GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual general meeting was held in the rooms, 180, West Regent Street, on Monday evening, January 19th. Mr. JOHN MORISON, junr., took the chair on his election as president. The following office-bearers were also elected for 1891 :—*Vice-President*—Mr. Thomas Taylor; *Treasurer*—Mr. Hugh Reid; *Secretaries*—Messrs. Wm. Goodwin and J. C. Oliver; and a council of six members.

Mr. THOMAS TAYLOR then gave a demonstration of "Platinotype Printing."

The meeting closed with the usual display of lantern views by members, shown by limelight.

### THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

*January 22nd.*—Mr. W. BEDFORD in the chair. Mr. Thomas Illingworth and Mr. F. Parsons were elected members of the Association.

Mr. T. E. Freshwater presented Mr. Lewis Wright's latest work on "Optical Projection" to the library. A volume of Ganot's "Physics" was presented by Mr. A. Haddon.

A demonstration was then given by Mr. L. WARNERKE on "Collography." The lecturer expressed his opinion that a wide future is open for photo-mechanical printing. There was a general belief that special appliances were necessary, and that generally all processes of this kind were troublesome to work. The demand for cheapness and quickness of production had proved detrimental to good work. The process he intended to demonstrate was simple, requiring no special apparatus of any kind, enabling amateurs to produce quickly an unlimited number of copies on ordinary paper, with printer's ink, from photographic negatives. For the purposes of demonstration, the lecturer had brought with him several sheets of exposed films in various stages. He proceeded to describe the process : A sheet of vegetable parchment, having a film of gelatine on its surface, is immersed for three minutes in a bath of bichromate of potash neutralised with ammonia. The sheet is then squeegeed to a glass plate that has previously been cleaned and polished with French chalk. The plate is now left to dry spontaneously. The drying should be completed in about ten hours, when the film will peel off its support. The maximum of sensitiveness would be reached in from two to three days after sensitising. The object of drying the sheets on glass is to produce a flat surface, thus giving perfectly even contact with the negative. The sensitised film is exposed in an ordinary printing frame. When sufficiently exposed, the image will be quite visible. An exposure of the back of the film for two or three minutes to diffused light will cement it to the parchment support. The exposed tissue is now placed in water, and allowed to remain about two hours until quite colourless ; it is then drained and blotted, and the following solution poured over it :—

| | |
|---|---|
| Glycerine ... ... ... ... ... | 70 parts |
| Ammonia ... ... ... ... ... | 3 „ |
| Water ... ... ... ... ... ... | 30 „ |

After soaking for an hour, the tissue is stretched upon a frame over a block of wood, and rolled up with printer's ink. For this purpose, the lecturer recommended using first a stiff ink, and afterwards a thinner kind. Authorities differed with regard to the materials for thinning the ink. The lecturer said he preferred lard for this purpose. Sufficient rolling having been given to the surface of swelled gelatine, a sheet of paper is placed on it, and an impression can be taken in an ordinary letter copying press. Mr. L. Warnerke, at the conclusion of the demonstration, pulled several proofs from a sheet of prepared tissue, and passed them round. In answer to several questions, Mr. Warnerke said he was unable to state the limit of the number of impressions that could be taken from one sheet ; he had taken as many as 300 himself. Any paper might be used. It was necessary in printing to lay strips of paper round the inked image to protect the sides of the sheet of paper receiving the impression.

Mr. T. Bolas, after referring to the very lucid manner in which the lecturer had described the process, said he doubted whether the use of vegetable parchment as a support for the sensitised film had any advantage over a glass plate. The latter process involved less labour, and he preferred the results produced by it.

Mr. W. England spoke in praise of the work of Mr. Ernest Edwards, a rigid support being used.

Mr. Bolas said that one of the faults of loose films was the production of a halo round any dark object in the picture.

Mr. W. E. Debenham said that this would only be found in the first impression taken.

Mr. Warnerke said that some of the finest collotypes he had ever seen had been produced by Balagny's machines, exhibited in the recent French Exhibition at Paris.

Process Work.—In everything constructed by the hand of man, from a thirteen-story building to a coal scuttle, or from a wash-tub to an ocean steamer, is found design presupposing designing, and nearly always decoration involving a question of taste. The order of creation in the human world is, first conception, next delineation, and last construction. Under the pressure of this enormous demand for illustration have developed those many processes of reproduction made possible by photography, by which the rapidity of constructive work is so very greatly facilitated, and the transient scenes of daily life in all quarters of the globe are laid before our eyes almost as soon as they occur. The limit of all process work, however, is existence. The non-existent can only find expression through the intelligence of man, and his hand must ever remain the instrument by which are called into being the creations of his mind.—*The Cosmopolitan.*

# Answers to Correspondents.

All Communications, except advertisements, intended for publication should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

W. D. B.—*Donkin's Portrait.* Mr. Spooner, of the Strand, had an excellent portrait of the late W. F. Donkin, taken, if our recollection serves, by Mr. Barraud. Failing this, apply to Mr. F. A. Bridge, of Dalston.

Pharm.—*List of Members, Photo. Soc.* In our reply to you a fortnight ago, we inadvertently stated that the *last* printed list of members, Photographic Society, appeared in February, 1889. This was an error, as we now learn from the secretary ; there was another list issued in February last.

A. S. H. (Bury St. Edmunds).—*Recovery of Silver from Mixed Hypo and Chrome Alum.* The quantity of chrome alum you have been using is unnecessarily large ; one-fourth that quantity would have sufficed. Moreover, it introduces a difficulty in the recovery of silver, for when sulphide of sodium (hepar-sulphuris or "liver of sulphur") is added to such a mixture, there is a tendency to throw down oxide of chromium along with the desired sulphide of silver. To remove this contamination, you should filter it off and digest the black precipitate first obtained with dilute sulphuric acid, in which the chromic oxide alone is soluble. Now filter again, wash the black sulphide until free from acid, dry it, and fuse with an excess of nitrate and carbonate of soda to get pure silver.

E. P.—*Some Applications of Photography.* The lecture which Lord Rayleigh intended to deliver at the Royal Institution last week has been postponed until Friday, February 6th, in consequence of domestic bereavement.

H. J. B.—*Messrs. Hurter and Driffield's Paper.* Discussions have taken place at the Parent Society, Camera Club, and at the Liverpool section of the Society of Chemical Industry, where, in May last, the original paper was read. The latest communications will appear in the forthcoming official journal of the last-named society. They reach to great length, and it may not be possible to reproduce them *in extenso* ; that, however, is a matter for the decision of the editor.

A. M. M.—At this period of the year, when back numbers have been sent to the binders, one has to trust to the memory. Thank you for reminding us.

E. W. B.—The question you ask is one of the most difficult upon which to give advice. We will write to you in the course of a few days.

J. P. and Co.—The particulars asked for shall be sent to you.

W. E. M.—Mr. J. R. Gotz, of 19, Buckingham Street, Adelphi, keeps it in stock.

Lab.—*Vegetable Reds for Isochromatic Work.* We should be afraid to trust them ; for although, as you say, red cabbage, beet-root, and red currant seem tolerably permanent in stock bottles, there is always a tendency to change colour when exposed to the atmosphere. A trace of ammonia escaping from the developers in the dark room might be enough to change over the red to blue in plates prepared and stored in your dark cupboard. Try the experiment, and report the result. Much will depend upon whether you required the tinted plates for immediate use, and a little acetic acid might help to make the colour more permanent.

A. W.—*Bromide Printing and Finishing.* Mr. A. H. Bool's little treatise on "Photographic Painting" has a chapter devoted to working up bromide enlargements in black and white. With these few hints, and home practice, you ought to succeed ; and then you could offer your services by advertisement. Being far away from any recognised centre increases the difficulty of your getting practical lessons.

Darnley.—The burnisher can be got of Messrs. Marion and Co., or of the Eastman Company.

H. L. (Highgate), R. M., and other correspondents in our next.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1692.—*February* 6, 1891.


CONTENTS.



## PICTURE HANGING AT EXHIBITIONS.

The welcome disappearance of frost and snow will urge most photographers to hope that "the winter is past and gone," and that, with the singing of the birds, the time has come when they must think of the hanging of their pictures at the different exhibitions which will be soon opening their doors. The work entailed upon the organisers of a photographic exhibition is most arduous, and seldom is acknowledged as it should be. First comes the circularising, then the arrival and unpacking of pictures, next the most unthankful task of hanging the same, and finally the re-packing, labelling, and returning of the works of art to their respective owners. All this work, with little to show how hard it has been, and how much time it has occupied, has made many a willing but over-burdened secretary exclaim that he will never have anything more to do with an exhibition of photographs.

The question arises, "Can any of this work be dispensed with, and the business of conducting an exhibition be made easier and cheaper to all concerned?" We have no hesitation in answering this question in the affirmative, and will now point out how the much-desired reform can be carried out.

In the first place, there is no necessity why photographs sent in for exhibition should be framed, and when once this part of the reform is agreed to, we clear the ground of a great deal of difficulty. The framing of a picture, the provision of a packing-case for it, and the bother connected with sending it off by rail, are considerations which prevent many lazy persons from exhibiting at all. Others are obliged to consider the expense, and they, too, are often compelled to keep their pictures at home. Now and then, it is true, we see a portfolio of photographs lying on a table at a photographic exhibition, but few take the trouble to turn over its leaves. The pictures on the walls prove the greater attraction, and to these the majority of the visitors direct their attention. We must therefore adopt some method of showing the pictures in this popular manner, and the difficulty which presents itself is to do so without encasing them in ordinary frames, and, at the same time, protect them from dust and other sources of injury. This difficulty has been surmounted by the Bristol Academy, whose winter exhibition of sketches we visited last week; and it stands to reason that a plan which is applicable to sketches in water-colour, and which is found to work economically in practice, can be adapted to photographs.

To make the matter easy of comprehension, let us suppose that it is intended to exhibit a single line of pictures only. The mounts should be generally of one outside measurement, and a size can easily be adopted which will give a fair margin for all the larger sizes of pictures, the smaller ones being grouped together so as to fill in the same amount of space. Having fixed upon this size, two horizontal laths are nailed against the wall of the exhibition room at such a distance apart that the mounting boards will just fit in between them. The pictures, being mounted, are placed in position, and over each mount is fixed a glass of the same size, a couple of brads being driven into the edge of each lath to prevent glass and mount falling out. When the line of pictures is complete from one end of the wall to the other, the laths have tacked upon them a thin slip of wood which is about double the width of the original lath, and which, therefore, overlaps it on either side, thus hiding the holding brads. This wooden slip is painted white, and on it the printed catalogue numbers of the pictures are gummed. For the sake of simplicity, we have supposed that only one line of pictures is in question, but, in practice, there would be at least three, so that the bottom lath which we have described would form the top of another line of pictures underneath, and the top lath would form the base of another line above. In the case of pictures, such as portraits, having their longer diameter vertical, it would be necessary to cut out and raise a portion of the upper lath for their accommodation. But the best plan is that adopted at the Bristol Exhibition already cited, and that is to place, as far as possible, pictures of irregular and odd sizes together on one wall, where, by a little skilful arrangement and cutting of laths, they can be accommodated together.

This system, by which the expense of frames, packing cases, and risk of breakage are obviated, has been adopted at the Bristol Academy Exhibitions for the past five years, and is found to work well. These exhibitions are by no means small affairs, if we may judge by the present one, where nearly one thousand sketches are shown. The only initial expense is the glass, laths, and cardboard for mounts. The cost of these items obtained from a wholesale firm could be readily covered by a moderate fee, which would be willingly paid by each exhibitor. The pictures could be sent by post unmounted, or mounted ready for exhibition on the regulation sized cardboard for a few stamps. Last, but not least, no space would be required at the exhibition rooms to store the mass of packing cases which always accumulates at such places. We shall be very glad to elicit opinions from all interested in the subject upon the reform suggested.

## FEER'S DIAZO PRINTING PROCESS.

The primuline printing process of Messrs. Green, Cross, and Bevan having excited so much attention, there is naturally a good deal of interest existing concerning the diazo process of Dr. Feer, especially as the latter is more in line with the printing processes in constant use amongst photographers in the matter of yielding a positive print from the negative. The two diazo processes will probably find somewhat different fields of usefulness, differing as they do in important characteristics. From the following account of Feer's process, contained in the specification of the German patent, it will be seen that there is no after-development required, the print showing itself like the familiar silver print whilst still in the press, and the only subsequent treatment required is the removal by washing of the sensitive compound not affected by light.

*Process for the Production of Coloured Photographic Images. Patented in Germany, December 5th, 1889.*

The following process depends upon the fact, which the inventor has discovered, that diazosulphonic salts (R—N=N—$SO_3$ Na) with phenolalkali, and chlorides of or free aromatic amines, react under the influence of solar or of the electric light, forming an azo dyeing substance.

For carrying out the process, the inventor impregnates paper or textile fabric with a dilute molecularie mixture of a diazosulphonic salt (for instance, of aniline, amidoazobenzole, benzidine, and their homologues) and phenol alkalis (for example, phenol, resorcin, and β-naphthol) or chloride of, or free amines (aniline, naphthylamine phenylendiamine, and homologue). The paper or fabric is then dried in the dark, and exposed for about five minutes to the sun, or to the electric light. Thereby is formed in the illuminated portions an *insoluble* azo dye, whilst the parts protected by the opaque portions of the negative remain in their original colourless and soluble condition. The picture is thus developed while printing. It is, after exposure, washed with water, or with very dilute hydrochloric acid, whereby the unaltered sensitive preparation is washed from those parts not affected by light, through the negative. The picture is thus fixed, and only requires drying to finish it.

The following are some examples of mixtures with which the paper or fabric is treated:—

| | | |
|---|---|---|
| 1.—Toluoldiazosulphonate of soda ... | 25 | grammes |
| β-Naphthol ... ... ... | 25 | ,, |
| Caustic soda ... ... ... | 8 | ,, |
| Water ... ... ... ... | 1,000 | ,, |
| 2.—Ditolyltetrazosulphonate of soda... | 25 | grammes |
| *m*-Phenylendiamine ... ... | 8 | ,, |
| Water ... ... ... ... | 1,000 | ,, |
| 3.—Ditolyltetrazosulphonate of soda... | 25 | grammes |
| Resorcin ... ... ... ... | 22 | ,, |
| Caustic soda ... ... ... | 16 | ,, |
| Water ... ... ... ... | 1,000 | ,, |

The following examples will illustrate the application of ditolyltetrazosulphonate of soda mixed with resorcin and α, β-naphthol respectively, and phenylendiamine.

*Preparation of the Solutions.*

| | | |
|---|---|---|
| 1.—Ditolyltetrazosulphonate of soda ... | 30 | grammes |
| Resorcin ... ... ... ... | 20 | ,, |
| Caustic soda ... ... ... ... | 15 | ,, |

All, finely powdered, are dissolved by gentle heat in one litre of water.

| | | |
|---|---|---|
| 2.—Ditolyltetrazosulphonate of soda ... | 30 | grammes |
| α-naphthol ... ... ... ... | 25 | ,, |
| Caustic soda ... ... ... ... | 7 | ,, |

Dissolved in one litre of water.

| | | |
|---|---|---|
| 3.—Ditolyltetrazosulphonate of soda ... | 30 | grammes |
| Phenylendiamine ... ... ... | 20 | ,, |

Dissolved in one litre of water.

The solutions 1 and 2, or 2 and 3, may be mixed in equal parts.

The paper is impregnated with the above mixture, and then exposed for from ten to fifteen minutes to direct sunshine. After exposure, the picture is washed with very dilute hydrochloric acid, then with water, and finally dried.

*Patent Claim.*—A process for the production of coloured photographic images on paper or textile fabrics, consisting of the preparation of the material with an aqueous or alcoholic solution of a diazosulphonic salt and a phenol alkali, benzene, a chloride, or free amine; dried in the dark, then covered by a negative, exposed to the influence of solar or the electric light, whereby an insoluble azo dye is formed only in the parts affected by light, the picture being thus developed; and, finally, the preparation unaffected by light is washed out with water or dilute hydrochloric acid, and the picture is thus fixed.

## SUBAQUEOUS PHOTOGRAPHY.

Subaqueous photography of different kinds has occassionally attracted attention upon the Continent, and one of the latest applications of it has been the photographing of the movements of fish by means of a number of rapid successive exposures; this work was done in an aquarium, with the camera outside and the fish inside a glass tank. The Swiss have, some years past, devoted occasional attention to subaqueous photography, and one plan employed was to put a camera inside a small but heavy iron stove made water-tight, and with a plate of glass cemented in the round hole in the top of the stove for stoking. Probably, with a special camera resting on the river or sea-bed, and with its shutter and movable portions actuated by electricity, no extensive view will ever be taken even in the clearest water. The divers at work in making the new Folkestone harbour told us that, at the best of times, when the water was at its clearest, they could never see anything many yards from their point of view.

Should it ever be possible to photograph rapidly beneath the sea, revelations of the deeds of the inhabitants of the deep waters would sometimes be of dramatic interest. For instance, a recent number of the *Vancouver's News Advertiser* sets forth how, upon the Sunday morning, two divers, Llewellyn and McHardy, who were engaged in repairing the water-pipes in the Narrows, had a novel experience of a fight with an octopus, commonly known as a devilfish, and says that the chances of escape are small indeed for anyone who may be unfortunate enough to be once wrapped in the embrace of any of its eight tentacles. There are not many of the species in the waters about Vancouver, a stray one only now and again taking a trip up from Victoria, where they exist in large numbers. Once or twice only have any of them been met with in the inlet.

"It was, therefore, with some surprise that diver Llewellyn, who has met with them in the waters of San Francisco and Victoria, beheld one yesterday when he descended from the deck of the steamer *Clyde* to the bottom of the Channel. The octopus was lying beside the pipe, engaged at his matutinal meal. His simple fare consisted of crab, and that his appetite was good was evinced by the fact that crab shells were lying scattered along the pipe for a considerable distance. The octopus was reposing at the spot where the divers were going to work, and it was necessary either to remove him, or to wait until he saw fit to remove himself. Diver McHardy had followed Llewellyn to the bottom, and the two now held a conversation by means of signs as to how they should act, and it was decided to make the attack at once.

"Accordingly Llewellyn got on one side, McHardy stayed on the other side, and it was arranged that at a sign from the former, both should attack the enemy with the iron crowbars, about eight feet long, which they had with them. The octopus during this time was eyeing the divers with an intent gaze, as if sizing them up for a meal. He was also expectant of an attack, and awaited the beginning of hostilities with confidence. The divers, at a signal, approached the monster, who, raising a couple of his feelers, prepared to ward off attack from either side. A considerable time was consumed in fencing, but at length McHardy, taking what he considered a favourable opportunity, jumped forward and made an effort to run his crowbar through the body of the octopus. The blow was warded off, and at the same moment the diver's leg was caught by one of the tentacles of the devilfish. The habit McHardy wore protected him, however, and Llewellen, having the fish off his guard, so far as he was concerned, struck his crowbar through the brute's body, and then seizing the sledge used for hammering the pipe, worked away with commendable energy on the tentacle which held his companion. It took him about two minutes to sever the tentacle from the body.

"They then covered the body with large rocks, and when they had completed their work, they left it till they should return in the afternoon. When they did return the fish was still alive. They hoisted it aboard the boat and brought it to the city, where it was examined by a number of citizens on Tuesday."

---

Sir Frederick Augustus Abel, Kt., C.B., President of Committee on Explosives, War Department, has been appointed an Ordinary Member of the Civil Division of the Second Class, or Knights Commanders of the Order of the Bath.

## LORD MONKSWELL'S COPYRIGHT BILL.

BY C. FLEETWOOD PRITCHARD.

Lord Monkswell has just introduced into the House of Lords a Bill to consolidate and amend the law relating to copyright. This is a branch of the law which affects photographers very nearly, and the Bill proposes to make several alterations in it of considerable importance; it therefore behoves photographers to give the matter their earnest consideration. It must also be remembered that if the Bill should pass, it will in all probability be a long while before photographers have another opportunity of amending the law relating to this subject. The following are some of the more important of the proposed alterations.

In the first place, the Bill proposes to make an alteration in the duration of copyright. At present, copyright in a photograph is given for the life of the photographer, and for seven years after his death, and it is proposed by the Bill that it shall, in future, be for thirty years from the end of the year during which the photograph is published. This in itself appears to be an improvement, as it substitutes a fixed period for one of great uncertainty; but it will be noticed that in the case of paintings and sculptures the proposed term is the life of the artist and for thirty years after his death—a much longer period than that proposed for photographs. Engravings are treated in the same manner as photographs.

In the next place, it is proposed that where a photographer employs an assistant, then the copyright of any photograph taken by that assistant shall belong to the employer. In this way the difficulty which arose in the case of Nottage *v.* Jackson is overcome.

Under the present law, it will be remembered that, when a negative is sold for the first time, the copyright is altogether lost unless a written agreement is made between the buyer and the seller at the time of the sale. The Bill proposes to remedy this by enacting that, unless any agreement is made, the copyright shall remain with the seller. Similarly, the copyright of a photograph taken on commission is to belong to the photographer, and not to the person for whom the photograph is taken.

Then it is provided that where a photograph of any work of fine art—*i.e.*, a painting, sculpture, or engraving—is made to the order of the owner of the copyright therein, the copyright in the photograph is to belong to the latter, and not to the photographer. This seems rather hard on the photographer, as he would, in that case, be unable to prevent others from copying his work.

By Clause 41 of the Bill, where "a photographic likeness" of any person is taken on commission, neither the photographer, nor any other person, whether he owns the copyright or not, is to be allowed to sell or exhibit in public, in any shop window, or otherwise, any copy of the photograph without the consent, in writing, of the sitter, or of the person for whom the photograph was taken; and any photographer who contravenes this clause is to forfeit every copy of the photograph which he has in his possession, including the negative. This clause really carries the law very little farther than that enunciated by Mr. Justice North in the case of Pollard *v.* The Photographic Company, rather more than two years ago. In that case, it will be remembered, the judge stated that a photographer who had been employed by a customer to take his portrait is not justified in striking off copies of such photograph for his own use, and selling and disposing of them, or publicly exhibiting them by way of advertisement or otherwise, without the consent of the customer. At the same time, this is a question of very great importance to all professional photographers, and they should carefully consider whether it would not be well to propose some amendment.

As regards registration, it is not proposed to make many alterations of any importance. The principal seems to be the abolition of the Registry at Stationers' Hall, and the establishment of another to be called the Copyright Registration Office, under the control of a Registrar of Copyrights, and under the superintendence of the Board of Trade. The proposed form of "Request for Registration" is, in the case of photographs, much the same as the present form, except that the second and third columns (*i.e.*, the columns for the date of, and the names of the parties to, the agreement or assignment) are omitted, and another column is added for the date of publication. In all cases the fee and a copy of the photograph must accompany the form. Immediately on receiving the form, the Registrar is to give to the person requesting the registration a "Certificate of Registration of Copyright," which is to be *primâ facie* evidence of title to the copyright registered.

Instead of bringing an action against any person who infringes a copyright, it is proposed by the Bill to allow the owner, if he likes, to summon the offender before a police magistrate or other court of summary jurisdiction, and the magistrate may, if he is found guilty, order him to pay a fine not exceeding £5, which is to be given to the owner of the copyright by way of compensation. This would be a great advantage where the copyright is not of any great value, as the proceedings would be less costly and much more rapid.

It should be added that, according to the memorandum which is circulated with the Bill, the alterations proposed to be made in the law are for the most part those suggested in the Report of the Royal Commission on Copyright of 1878, and embodied in a Bill introduced at the end of the session of 1879 by Lord John Manners, Viscount Sandon, and the Attorney-General, on behalf of the then Government.

## A NEW WHEEL CAMERA.

A new hand-camera of that new class in which the plates are removed one by one from their receptacles by means of a wheel, then exposed, and afterwards stored away, has been issued this week by Messrs. Marion and Co., and contains features of striking novelty. Fig. 1. is a plan of the machine. At one end are seen the grooves in which

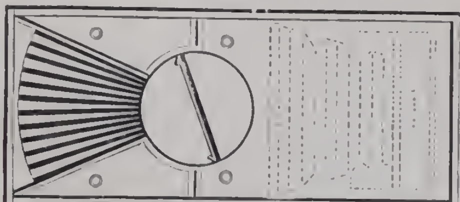


*Fig.* 1.

the plates are packed vertically. Any plate is picked out at will by means of the wheel apparatus, brought into position for exposure, and afterwards returned to any groove the operator chooses. Thus, supposing him to have charged the receptacle with rapid and slow plates, and a few which have been made orthochromatic, he can in a moment select any plate which will suit the particular subject before him. Fig. 2 represents the interior of the camera with its side removed.

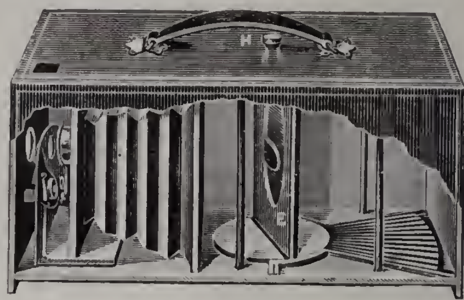


*Fig.* 2.

In order that the grooving may be true, it is made of electro-deposited copper thrown down upon a gutta-percha mould truly made into form by a die and heavy pressure. This mould is then blackleaded, and copper, by means of a suitable current. thrown down upon it in a malleable condition of molecular aggregation.

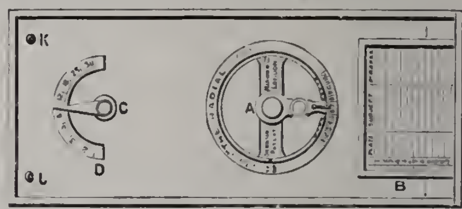



*Fig.* 3.

Fig. 3 represents the under part of the camera, with the governing and regulating parts of the apparatus.

Focussing is effected, when desired, by moving the pointer C to a suitable position on the scale D. By suitably turning the pointer A, a plate is released from any groove, and afterwards returned to it or any other desired groove. B is a removable card for recording exposures. The knob at J, attached to a cord, sets the shutter: a gentle pull at K makes the exposure.

The camera can be fitted with the purchaser's own lens, provided he possesses one of suitable focal length. The lens otherwise issued with it by the makers is a rapid one by Voigtlander. The grooves will take plates varying in thickness; the plates are pressed in the carrier by means of a spring, to ensure that their faces are in true focus. The camera is the invention of Mr. Dickinson, one of the members of the staff of Messrs. Marion & Co. Great pains have been taken to make it light-tight, and to prevent the plates getting jammed anywhere during the manipulation of the instrument.

The camera is a refreshing novelty, and, so far as can be judged from inspection, we think that when in practical use it is likely to justify the enthusiastically high opinion of its merits held by its manufacturers.

A Boy's Camera.—The Blackfriars Photographic and Sensitising Company has sent us for review a "boy's camera," which is a marvel of cheapness; it includes folding tripod legs, bellows camera, double dark slide for quarter-plates, and a lens. Photographs can be taken by its aid, as we have proved, and good ones can be taken by those who use a stop of suitable diameter, and allow in focussing for the difference of position of the visual and chemical foci. The first camera of many a boy has been made out of a cigar box and a spectacle lens, but the one under notice is a far more elaborate instrument. A lens of longer focus would suit it better.

## NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. IV.

The greatest difficulty in portraiture has always been the group. This has been almost as much evident to the painter as the photographer. If the painter represents his subjects as simple resemblances they are too often stagy and stiff; if, on the other hand, he supplies them with a centre of interest, and presents them as "doing something," they look as though they were doing it for the purpose of being painted, and who does not recognise the air of conscious sham that pervades the representations of even such spectacular subjects as court ceremonies, although they may be painted by the greatest artists? What is the unfortuate artist to do? In his attempt to be pictorial he meets with many obstacles. He must not partly hide a face, or introduce a back view of a figure, often useful for obtaining variety of pose, and as a foil to other figures; he must show every one at his best; the chief personages must be conspicuous, even if they were not very visible in the real group. Of the painters, Wilkie and C. R. Leslie almost succeeded with these impossible subjects, but it was at some expense of truth. It was left for an impressionist painter to show us what would happen if such a subject were treated literally. In the *Art Journal* for January is a process block from a picture by Mr. John Lavery, representing the ceremony on the occasion of Her Majesty's visit to the Glasgow Exhibition, 1888. The principal object is an official in his robes filling a foreground corner, the reader of the address is a little figure in the distance, and Her Majesty is to be found, after diligent search, some way out of hearing distance of the reader. One half of the space is filled up with the steps of the spacious dais, under the canopy of which Her Majesty is seated almost out of sight. This may have been a correct impression of the scene; the picture may be full of air, and space, and truth of the subtlest kind; it may be full of expression and spirit, and all other impressionist qualities; but if we may judge by the engraving, it does not do justice to the portraits, and thus the principal object of the picture is not fulfilled.

Perhaps the most realistically natural group of two figures ever painted is to be found in the "Portraits of a Merchant and his Wife," by Van Eyck, in the National Gallery. It represents a man and woman standing to have their portraits taken. This is just what they must have been doing, and they look like it. Legends have been invented to explain the subject, and account for the pose of these two marvellously painted figures, but all that is apparent is that they were standing for the painter.

Now-a-days, when we want to make figures look "so natural," we are expected to make them appear to be doing anything but pose for their portraits, while they are doing nothing else all the time. What is the most natural thing a boy will do when he is asked to stand for his portrait? He will look at the camera, and be interested in what you are doing with it. This is an argument that may, of course, be carried too far, but there is exaggeration in the other extreme, which has been advocated to such an extent by recent writers on art who talk about nature without understanding, that the unfortunate photographer is now almost afraid to allow his sitter to look at him.

A portrait should not be a snap-shot accident of a man. It should be a deliberate presentment of the best that is in him, portrayed by the artist after a careful study of his subject, and cannot be other than to some extent a conventional representation. It is all very well if you can combine the natural with the portrait, but the effort, even with the greatest artists, almost always ends in the make-believe. Take, for instance, one of the greatest portrait pictures in the National Gallery, the "Family of Darius at the Feet of Alexander the Great, after the battle of Issus," by Paul Veronese. That event purports to be the subject represented, but the principal figures are portraits of the Pisani family. The picture was intended for a portrait group, and the artist has taken an historical incident of the year 333 B.C., so as to give his figures an opportunity of "doing something" and looking "so natural." To do this he has seen no absurdity in, and not scrupled to represent his sitters in, Venetian armour and robes of a period more than 1500 years later than the time of the incident portrayed. It is one of the great pictures of the world; is wonderfully painted; is marvellous in colour and handling; not one face looks "at the camera;" but if one looks for the nature that is expected in modern art, one cannot help feeling that the monkey on the balustrade is the most natural bit in the picture.

I do not pretend to argue that no portrait group should have a motive or leading idea, but I feel that this method of composing a group may be often carried too far, and is often strained.

In the last century the group was a favourite method of presenting portraits, and Zoffany, Hogarth, and a few others, in their "conversation pieces," of which we see examples in every exhibition of Old Masters at the Royal Academy, managed to maintain the just medium between the natural motive and the unnatural strain; with others the family group degenerated into burlesque, and was often ridiculed by the writers of the day. The description of the famous classical group in the "Vicar of Wakefield," "by a limner who travelled the country, and took likenesses for fifteen shillings a head," is an instance familiar to all who have read that delightful tale, and shows the perverted taste of the time. It will bear repeating. It was to be a large historical family piece, for all families of any taste were now drawn in the same manner, and designed to show the superiority in taste of the Primrose family over their neighbours, all the seven of whom had recently been drawn each with an orange a piece—"a thing quite out of taste, no variety in life, no composition in the world." As the vicar relates, "My wife desired to be represented as Venus, and the painter was requested not to be too frugal of his diamonds in her stomacher and hair. Her two little ones were to be as Cupids at her side; while I, in my gown and bands, was to present her with my books on the Whistonian controversy. Olivia would be drawn as an Amazon, sitting upon a bank of flowers, dressed in a green joseph, richly laced with gold, and a whip in her hand. Sophia was to be a shepherdess, with as many sheep as the painter could put in for nothing; and Moses was to be dressed out in a hat and white feather."

This is scarcely an exaggeration of the state of artistic taste at that period. Another less known anecdote may interest the reader, who knows the difficulty of composing a portrait group, and pleasing the whims and fancies of his exacting patrons.

One day a wealthy merchant drove up to the door of Hoppner, the portrait painter. Out of the carriage stepped a gentlemen and a lady, with five sons and seven daughters, all *replicas* of the parents; as well fed and comely a city-bred family as any within the sound of Bow Bells. "Well, Mister painter," said the father, "here we are, a baker's dozen; how much will you demand for painting the whole lot of us? Prompt payment for discount." "Why," replied the astonished painter, "why, that will depend upon the dimensions, style, composition, and"——"Oh, that is all settled," quoth the enlightened merchant; "we are all to be touched off in one piece as large as life, all seated upon our lawn at Clapham, and all singing, God save the King."'

## THE INTERNATIONAL CONGRESS AND THE PHOTOGRAPHIC SOCIETY.

The Council of the Photographic Society of Great Britain has appointed Captain Abney, Sir H. Trueman Wood, and Mr. Leon Warnerke to represent the Society at the International Photographic Congress, which will be held at Brussels this year. A notice has appeared in the Society's Journal, inviting the members to send suggestions as to subjects which they consider should be brought before the Congress by Captain Abney. As it is probable that several of the other photographic societies in the Kingdom will also appoint delegates to the Congress, it might be advisable for those so appointed to communicate with the delegates of the Photographic Society, so that the propositions made by this country may be supported by all its representatives.

The last Congress decided to adopt a decimal system for marking the diaphragms of lenses, but as two of the large lens makers have adopted the Photographic Society's standards, and as there may be many thousands of lenses in existence so marked, the question may possibly arise whether it would be advantageous if the forthcoming Congress would revoke the decision of the last Congress, and adopt *f*/4 as the unit aperture for diaphragms.

There would be an advantage if the decisions of one Congress were interfered with as little as possible by its successor, otherwise it will be years before anything practical is done. Last year was the time for the Photographic Society to officially have raised questions about its standards; either it was not invited to join the Congress, or did not accept the invitation. How this matter stands has not yet been published.

The determination of the speed of shutters was referred to a committee by the last Congress, so a report may be expected upon this subject.

At the Paris Congress the question of copyright was discussed, and a number of resolutions was passed; we think, however, the subject might again be brought up, and if an understanding were arrived at amongst the delegates, they might approach their respective governments with identical requests, and thus get this most troublesome question settled.

The Camera Club will not resume its Thursday evening meetings this month, because of the incomplete state of the new premises.

The *Gas World* states that somebody, evidently with the object of advertising a particular portrait process, suggests that all gas consumers should be supplied with a portrait of the accredited meter inspector, as a safeguard against imposters. To the horrors of the family album would then be added, "and that's our meter inspector!"

## PHOTO-MICROGRAPHY.

BY T. CHARTERS-WHITE, M.R.C.S.

Photographic delineation may be regarded from two different points of view; these are from the artistic point and the point of utility. The first case is that in which photography is employed for the purpose of producing pictures of landscape scenery modelled on the strictest canons of art, or as near to them as our limited capabilities will permit. In the second case usefulness alone comes in, apart from any consideration of art, such as in the copying of paintings, the reproduction of ancient documents and inscriptions, the recording of astronomical and meteorological phenomena, or in that branch of it which will occupy our attention for a short period this evening—viz., photo-micrography.

Photo-micrography may be considered under two heads, according as the practitioner may wish to employ low or high power objectives; whether he may be content with moderate amplification, or desire to perform feats of optical athletics in defining critical images. Under the first head he may find abundance of recreation, under the second he will find himself plunged into a maelström of worry and perplexity. But, presuming that he may be content with amplifications up to 200 diameters, I see no reason why anyone possessing a microscope and a camera should not be able to practise this branch of the photographic art with satisfaction to himself and instruction to his friends. I would, in all cases, recommend the beginner to commence with low powers—say, of about an inch focus, and pass up gradually to a quarter of an inch —and, after he has mastered some of those difficulties he will be sure to encounter at first, then pass on to powers of higher denomination.

In the practice of photo-micrography three things are essential, viz., a camera, a microscope, and a lamp. It will be convenient if I address myself to these several points; and first let me say that cameras for this work have been devised of every possible form, but the principle is the same. The one I particularly favour, and which, in my hands, has given me very good results, is not a camera at all in its usually accepted sense, but is a lidless box placed on its side, and containing the microscope and lamp, these, in working, being shut in by a velvet curtain to exclude the light from the studio. One end of this box is open to allow the protrusion of the microscope tube. The image of the object to be photographed is projected through the microscope on to a white paper screen fixed in the carrier, which also will hold, in subsequent operations, the sensitive plate; hence it follows that, if I can focus my object on this white screen with fairly good and sharp definition, I ought to get my negative as sharp as this image on the white screen; so you see the principle is the same as in ordinary enlargement. This carrier is mounted on a sliding base-board, and allows of the screen being withdrawn to the distance I think suitable for the work I have in hand. I can, by this method, cover a 7½ by 5 plate, or, by pushing the carrier within about a foot of the microscope, reduce my image to a size suitable for lantern plates. This, therefore, gives me a great range of amplification.

There is one point about this sliding base which I might mention, as by it I am enabled to decide the number of diameters my object is magnified. Starting with the lower power I use, I place a diatom whose known diameter is exactly $\frac{1}{100}$th of an inch in the microscope; I project its image on to the screen at one foot from the microscope, and, with a pair of compasses, measure off its amplification with that power on an ordinary rule, and thus arrive at the number of diameters it is magnified. I then do the same thing at two feet, three feet, and so on. I thus register the magnifying power of that object glass at these several distances. I adopt the same procedure with all the objectives I use, and thus form a table of measurements, to which I can readily refer in all cases. This apparatus of mine is comparatively simple and inexpensive, a matter to be considered in the absence of any regular department in the State set apart for our assistance in these matters. There is another advantage in this arrangement, and that is I can do all my work in one room, as the velvet curtain shuts in the lamp, and I can develop my negatives in the same room. But I must not take up more time in explaining this apparatus; a lantern slide to be passed through this evening will give a clear explanation of its construction. It may be necessary to say that all generally required is an ordinary bellows-camera, or, even better, a sliding camera, placed on a firm base-board of well-seasoned mahogany or teak, about five feet long and one and a-half inch thick, and sufficiently wider than the camera to admit of a wooden ledge on each side being fixed, to form a broad groove in which the camera can slide backwards or forwards as required, with a thumb-screw through its tail-board to clamp it at any desired distance. This base-board must be supported in such a manner that any vibrations from passing traffic, or persons moving about the house, may not be communicated to the apparatus. I accomplish this by standing it on a fairly good sized bundle of journals placed at each end, and I find this stops the vibrations so far that very little evidence of a tremor is manifest in photographs I have taken up to 200 diameters.

I now come to that division of my subject which treats of the microscope; it is essential that this should be a steady, solid monocular, having a good, fine adjustment, for this is very necessary in getting absolutely sharp definition. Another indispensable adjunct is a substage condenser, fitted with a revolving diaphragm pierced with holes of varying diameters. In my rotating diaphragm attached to the condenser the apertures vary from 1-16th of an inch, the smallest, to ½-inch, the largest. The smallest is of no use in photographing, but it serves a very important office in enabling me to centre the light. Presuming that your camera and microscope are axially centred with each other and the lamp, it does not follow that the beam traversing these must be central, and though a great deal of this excentricity may be overcome by moving the lamp, it is not entirely overcome, but if the substage condenser has adjusting screws—which it ought to have— perfect centricity can be attained in this way: put in a very low power, and, having turned the diaphragm to the smallest aperture, project its image in the middle of the focussing screen, and get its borders quite sharp; now rack the condenser back, and the field will be found evenly illuminated. Should the low power be now changed for one of a higher grade, a further slight adjustment may be required, but, having already a rough approximation, this may be readily obtained. The centreing of the light is a most important proceeding, for, unless this is attended to, one side of the object will have a dark and fuzzy border, while the opposite side will be light and coloured, and what is thus easily perceptible in the borders extends throughout the whole object, and detracts from the general sharpness of the photograph; therefore, too much attention cannot be devoted to this point. The tube of the microscope should be lined with a dead-black paper, or a flare-spot from internal reflection will make itself obnoxiously evident in your negative. Some recommend black velvet as a lining; this answers very well, but, being thicker than paper, it helps to diminish the already-constricted field. The tube in my microscope is trumpet-shaped, which allows the rays from the object to diverge immediately on passing through the lens, thus removing the constriction, and neutralising any tendency to a flare-spot. I might also say that I never use the eye-piece of the microscope, as I find for my purpose I can do better without it.

While we are discussing the microscopic division of this subject, I would especially recommend that the lamp should be kept burning for some quarter of an hour or so before attempting to photograph, to allow of all the constituent parts of the apparatus to warm up and expand. The necessity for this is easily demonstrated by focussing your object as sharp as possible, and let everything remain undisturbed for about ten minutes. When looking at your object again you will find all sharpness has disappeared, and nothing but a blurred, indistinct mass is evident: but let expansion once take place, and no alteration of focus will occur the rest of the evening. I may add that in working with powers less than one inch focus, a great advantage will be derived from interposing a piece of ground glass between the bull's-eye lens of the lamp and the sub-stage condenser, its ground surface being placed next to the object. This, while it makes the light a trifle less powerful, and slightly prolongs the exposure, gives a soft, diffused light by its acting as a radiant.

The plan I have always adopted for obtaining a sharp image on the sensitive plate is one that I may recommend straight away, and thus save you the trouble of trying the various expedients suggested by many practitioners, but without satisfactory results in my hands. I say, remove the ordinary ground glass focussing screen from your camera, and replace it by a plain glass having some fine lines drawn across it with a writing diamond, these lines being placed next the objective. Now set your focussing glass till these lines are sharply defined. These lines will closely approximate to the plane of your emulsion on the sensitive plate, and, therefore, if you get the details of your object into focus with the lines on the focussing screen, the probability will be in favour of a sharp image on the negative.

The lamp I employ is an ordinary microscope lamp burning Strange's crystal oil, in which some camphor is dissolved to increase the whiteness of the light. A plano-convex bull's-eye lens is attached to it. Much discussion has taken place with reference to the position of this lens, some saying that the plane side should be next to the light, others advocating the reverse. I have tried very carefully the results to be obtained in both positions, and I cannot detect any difference in them; but, if anything, I prefer the flat side away from the lamp, and next to the condenser. I don't pretend to any knowledge of the laws of optics, and I only speak from my experience.

Having got these three constituent elements—camera, microscope, and lamp—as accurately centred as it is possible, and the apparatus warmed up, we may proceed to operate; and here the question of exposures crops up, and the difficulty begins. Exposures vary in proportion to the magnifying power of the objective used, and the colour of the object to be photographed. Although exposure tables, as in landscape photography, may offer the tyro a rough guide, giving some kind of idea to help at first, yet nothing but a cultivated judgment founded on experience can be of any permanent service. I know of no table which assisted me more than that framed by Mr. Walmsley, of Philadelphia, and for which I have in my heart often thanked him, and which I append to these rather voluminous notes.

When using

| | | |
|---|---|---|
| $1\frac{1}{2}$ inch objective | ... ... ... | 3-45 seconds |
| $\frac{2}{3}$ „ „ | ... ... ... | 7-90 „ |
| $\frac{4}{10}$ „ „ | ... ... ... | $\frac{1}{2}$- 3 minutes |
| $\frac{1}{6}$ „ „ | ... ... ... | 2- 7 „ |
| $\frac{1}{10}$ „ „ | ... ... ... | 4-10 „ |

These times may be regarded as approximate, but to be controlled by the nature, colour, and general character of the subject, and to which nothing but experience can furnish the right cue. I have left out much that might be considered desirable to touch on; but my great desire has been to render myself more extensively serviceable to my fellow-men, and, in the hope that there may be some present this evening who may feel inclined to extend their researches in the direction of photo-micrography, I have been tempted to lay the subject before them in its barest simplicity.

## HOSPITAL PHOTOGRAPHY.

Last week some information was published in these pages about an American system of photographing the dead, and the disinterested work of Mr. Oscar Mason. Some additional particulars are appended about his hospital work, extracted from a recent number of the *New York Sun*, kindly sent to us by a correspondent because of the interesting information on photography which it contains. The influence of vulgar wealth over the mind of the reporter who gives the narrative is characteristic; he seems unable to understand that a man can lead a life of self-sacrifice for the benefit of others:—

### BELLEVUE'S PHOTOGRAPHER.

*Twenty-two Years of Unpaid Work for Humanity.*

Oscar Mason and the Department of Hospital Photography which he Founded—A Curious Figure of Unselfishness in these Money-chasing Times—Work which has been a Model for the World.

Oscar G. Mason has been photographer to Bellevue Hospital for over twenty-two years. For several years he did the entire photographic work for nothing, and gave his entire time to it. He has never since received payment for anything except the work of photographing the unknown dead in the Morgue. That very useful department was added to the hospital at his suggestion. When he proposed it, he asked no compensation for it, and for a long time received nothing. It was only when the city officials practically refused to accept his services any longer without compensation that he consented to draw pay for the Morgue work. The bulk of his services, those in the hospital, he has persisted in performing for nothing, asking only that the city pay the bare cost of the chemicals used, amounting altogether to less than 200 dollars a year, and furnish him studio room rent free. As his studio has always been in the hospital buildings, this exaction has cost the city no outlay of cash. Mr. Mason has never used this studio for personal profit. It has never been a public gallery, and such private scientific work as he has done in it has been done at times when the hospital did not require his services, and with instruments and chemicals purchased by himself.

Bellevue Hospital's photographic appliances are numerous and of fine quality. The instruments are various, and suitable for all sorts of indoor and outdoor scientific work. Much of the most careful picture taking cannot be done in the gallery, because of the helplessness of the patients to be photographed, or the many operating-room instruments and surgical appliances to be used in the operations photographed. Such pictures must be taken in the hospital wards in insufficient light. Hence the simple appliances of an ordinary gallery would not suffice. Several complete portable instruments are in stock, with hosts of appliances to overcome the defects of the hospital wards from the photographic standpoint. There are nearly sixty fine and expensive lenses on the shelves of the hospital gallery. But Bellevue does not own a single instrument or lens, or, indeed, any of the minor appliances for developing, printing, and finishing. Everything in the gallery, except the few cheap chemicals, is the personal property of the photographer, and was purchased by him especially for the hospital work, and very rarely used for any other purpose. The use, as well as the time and labour of the photographer, are presented to the hospital by Mr. Mason. There is also in the gallery a photographic library equal to any private library of a similar character in the country, and immeasurably better than any other at the command of any national State, or civic authority. Mr. Mason has collected this library during an experience of many years as a practical photographer and a student of his art. It also is devoted to the Bellevue work without charge.

The photographer himself is on duty every morning early. There is always plenty of work for him to do. If there are no new cases to be photographed, there are plates to be developed and prints to be finished and mounted. There are accounts to be kept, scrap books to be brought to date, and records to be prepared for ready reference. Beside the routine work of the hospital he is always ready to do any outside work suggested by a hospital physician of standing which bids fair to be of real value to medical science and the world. He is a unique figure in these days of universal money grabbing, especially in his capacity as an almost gratuitous holder of public office. He has served the public weal after this fashion for twenty-two years, yet so modestly and quietly has he performed what he considered to be his daily duties to humanity and science that he has attracted no attention, and his accomplishments have never been known to more than a few hundred persons who, as physicians or surgeons, have come more or less in contact with him.

It is not generally known, either, that New York has led the world by a good many years in the matter of a photographic department to a city hospital. Mr. Mason was the first photographer to a hospital in the world, and it is only within a very short time that he has had imitators. He initiated this extremely important department at his own expense practically, and the results of his self-sacrifice have spread over the world. Many of the great medical works of the world have been illustrated by him without profit to himself, and several of the greatest would not have been possible without his gratuitous assistance. A few years ago, London and Paris established photographic departments in connection with their public hospitals, modelled upon the plan of that which Mr. Mason had established at Bellevue years before. Of late, Chicago and Boston have waked up to the scheme, and written on to authorities here for hints.

Mr. Mason is willing to give all the help in his power to inquirers who write him for points in connection with the proposed establishment of photographic departments similar to his in hospitals elsewhere. He has personally avoided notoriety, and it was only by persistent efforts that a *Sun* reporter succeeded in inducing him to talk about himself and his work.

(*To be continued.*)

The Photographic Club.—The subject for discussion on February 11th will be "The Production of Reversed Negatives;" February 18th, "Blisters."

## RESULTS OBTAINED WITH THE AMYL ACETATE LAMP.*

BY DR. J. M. EDER,

*Director of the Imperial School for Photography and Reproduction Processes, in Vienna.*

As is well-known, the International Photographic Congress in Paris adopted the amyl-acetate lamp as a practical standard of light, and this standard is certain and easy to apply.

For a knowledge of the light-sensitiveness of various photographic preparations, a comparison with the amyl-acetate lamp is desirable.

For this purpose a reduction to the so-called *meter-candle* is necessary. If the amyl-acetate lamp is taken as a unit. the amount of light falling vertically upon a surface placed at a distance of one meter is called a meter-candle (meter-kerze). The amount of light necessary to produce a visible action upon a bromide of silver gelatine plate can be accurately expressed in figures. According to Dr. Michalke, with oxalate developer a visible impression is produced on a bromide of silver gelatine plate when the latter is subjected during one second to the action of a volume of light equal to 0·045 of a meter-candle.

Making use of the table of sensitiveness of various photographic preparations, prepared by me, the following table is obtained. The latter gives the volume of light, expressed in meter-candles, which must act during one second to produce a visible effect.

TABLE.—*Amount of light, expressed in meter-candles, which must act during one second in order to produce a photo-chemical effect.*

| Light-sensitive preparation. | Volume of light in meter-candles acting during one second. |
|---|---|
| 1. Bromide of silver gelatine plate with oxalate developer, sensitiveness = 23° Warnerke | 0·05 |
| 2. Bromide of silver gelatine plate with oxalate developer, less sensitive = 18-19° Warnerke | 0·15-0·20 |
| 3. Wet collodion plate... ... ... ... | 1·8 (average 2) |
| 4. Daguerreotype plate ... ... ... | 27-90 |
| 5. Collodion dry plate, with alkaline developer, tannin, &c. ... ... ... ... | 9-14·4 |
| 6. Chloride of silver gelatine plate with oxalate developer (Eder) ... ... ... ... | 14·0 |
| 7. Pigment paper ... ... ... ... | 1440-5400 |
| 8. Silvered albumen paper, direct copying ... | 4500-18000 |

This table has, of course, only an approximate value. It gives, however, a very good summary of the necessary exposure required by the various methods. Expressing the sensitiveness of photographic preparations according to the effect of a meter-candle during a second's exposure, has this particular advantage, that it gives at once the relative exposure required by the photographic methods in question.

It must further be mentioned that only the first six photographic preparations in the table could be tested directly with the amyl-acetate lamp, not the two last copying processes, which are not in the least sensitive to the light of a candle or amyl-acetate lamp. In order to be able to take account of pigment processes and silvered paper in this table, their sensitiveness with daylight was used, *e.g.*, pigment paper is in daylight 800 to 3,000 times less sensitive than a wet collodion plate with ferrous-oxalate developer. Since this last requires 1·8 meter-candles for a visible impression, then the volume of light necessary for the production of a picture with pigment paper would be 1·8 × 800 to 1·8 × 3,000, or 1,440 to 5,400 candle-meters.

With orthochromatic plates and the amyl-acetate lamp the light-sensitiveness appears (compared with ordinary bromide plates) proportionately higher, which is evidently the result of the different spectral composition of daylight and the flame of the amyl-acetate lamp, since in the latter there are relatively many more orange-red, yellow, and green rays than there are blue and violet.

* "Photographic Mosaics." The original title is "Photometrical Determination of the Amount of Light necessary to Produce an Impression with Various Photographic Preparations."

---

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—The next meeting, on February 12th, at the "Champion Hotel," Aldersgate Street, will be a lantern evening, when visitors are invited.

ROYAL INSTITUTION OF GREAT BRITAIN.—At the general monthly meeting on Monday, February 2nd, Lady Abel, Mr. John Aird, M.P., Mr. Henry Graham Harris, M. Inst. C.E., Mr. Sydney Turner Klein, F.L.S., F.R.H.S., were elected members of the Royal Institution.

AMATEUR AND PROFESSIONAL.—A correspondent sends the subjoined cutting from *The Cape Register, Exchange, and Barter* of January 3rd:—"Photography—'Prefer loss to an unjust gain.' This, readers, is a very old proverb, but nevertheless the advice it gives holds good. Our readers may wonder what we are alluding to. As it is the duty of every free and independent newspaper to expose meanness in all its various aspects, we unhesitatingly call attention to the fact that the various photographers of this town—professional men who have undergone, in many instances, a long course of study to master the art, gentlemen who are paying high rents and heavy taxes—are deliberately and coolly swindled by so-called amateur photographers who on week days and Sundays roam about the country with their photographic apparatuses, and cheat the professional men out of their just dues. We do not by any means allude to those real amateur photographers who take a pride in the art, and practise for art's sake alone, and not for gain, but we refer to those persons (we might use a stronger name) who, with their photographic instruments and appendages, prowl in the vicinity of picnic parties, gentlemen's houses, and other places of interest, and without invitation proceed to take a likeness (as a rule it is the greatest daub imaginable), and when spoken to they invariably answer that they are simply amateur photographers, and will be glad to send a gratis copy, when finished, to the leader of the picnics alluded to, or the proprietor of the estate they have encroached upon; but they further hint that if an order is given for, say, one or two dozen copies, they will be compelled to charge *just a little* (?) to cover expenses. As a rule the bait is readily swallowed, the money paid in advance, and the order given. When the photos arrive at their destination—and sometimes they do not—the innocents see that they have copies of a very inferior description. But what can the victims of this duplicity do in the matter? Why, simply grin and bear it. A few days ago one of the fraternity coolly came up to a house in the Gardens and commenced operations. He took the house, he took the children, he took the dogs, and, in fact, he would have taken anything presentable. In this instance he was doomed to disappointment, and sternly told to clear out before he was able to complete his peregrinations, and he marched off with a sulky and disappointed air. This is one of many instances, and we are of opinion that the legitimate photographers of this and other towns should resent the conduct of these individuals in a proper manner, and no doubt the public would assist in the matter. We have penned these lines simply to expose what we consider a gross fraud, and we further hope they may be the means of calling attention to this glaring evil and unfair proceeding on the part of those who try to increase their living in an unmanly and surreptitious manner, and who should be made to pay the penalty of their pernicious conduct, and then they will all be '*Muet comme un poisson.*'"

# Notes.

A favourite and simple light for the enlarging camera, sometimes employed by photographers, consists of two fish-tail gas-flames, one behind the other, and with a diaphragm in front with such an aperture as to help to yield an image of the requisite sharpness. The brilliancy of the light is increased by first passing the gas through a warm chamber which has previously been charged with solid naphthaline. Once Mr. Frederick Varley had a curious experience in charging common gas with hydrocarbon vapour. He passed the gas through a vessel containing benzole, and the result was that he obtained as much light in a room with a smaller number of burners as he had previously obtained in the same room with a larger number of burners, yet the gas bill for the quarter was higher; the next quarter passed, yet again more gas was consumed than with the larger number of burners. Here, then, was a problem demanding experimental investigation, and by a little research he discovered that common gas is reduced in volume when it comes into contact with benzole vapour. This, although ordinarily objectionable from an economical point of view, is not so for lantern work, in which a small flame of great brilliancy is desirable; in fact, the aforesaid condensation of the gas is then an advantage. We do not know whether reduction of volume takes place when it comes into contact with vapour of naphthaline.

The advantage of the adoption of a standard light for certain photographic purposes is well illustrated in the article in another column by Dr. Eder, for by the aid of the amyl-acetate lamp, adopted at the last International Photographic Congress, he has photometrically determined the amount of light necessary to produce an impression with various photographic preparations. Not many of these lamps have yet been made in Paris, we believe, and somewhat bad accounts have reached us of the way in which they have been constructed; instead of being made with a silver tube for the wick, a nickel-coated brass tube is said to be used, which is attacked by the acid vapours given off by the burning pear oil. The reservoir of the lamp is too small, so that the contents soon disappear when the lamp is in action. This makes it inconvenient to use in the developing room lantern, or for any purpose in which a long period of combustion is desirable. When a properly-made amyl-acetate lamp comes into the market, it probably will not be used with pear oil at all by photographers, should the light paraffin spirit with the trade name of "benzoline" be found to answer the same purpose practically, whatever may be the case theoretically.

An undertaking of permanent historical value to photography has just been inaugurated at New York, in the founding of a collection "in which every photographic book and periodical ever published in English, French, German, or any other language, will be accumulated and placed in the Library of Columbia College, which is open from nine o'clock in the morning till ten o'clock at night every day in the year, except Sundays and other legal holidays, and to which every responsible person may always have access." An active worker in this matter is Professor C. F. Chandler, Columbia College, 41, East 49th Street, New York.

There was a meeting of indignant show-folk the other day at the Agricultural Hall to protest against the proposed "Movable Dwellings Bill," which is calculated to interfere with their rights as citizens to a very uncalled-for extent. The Bill owes its origin to Mr. Smith—a name which to Englishmen is so common that it has become necessary to distinguish the particular Smith referred to—and, in this instance, the gentleman is known as Mr. Smith of Coalville. He has done good work in bringing the wandering population, represented by our canal folk, under legislative notice; but he has gone a step too far in describing honest show-folk as a dangerous and immoral class of society, and in seeking power not only to register all travelling vans, but to enter such vans between the hours of 6 a.m. and 9 p.m., with a view to overhaul the domestic arrangements of the interior. An Englishman's house, whether it be on wheels, or more solid foundations, is his castle, and it is only natural that the show people should rise indignant against the implied slur upon their good name.

At this meeting, the leader of the opposition, if we may call him so without offence, was Mr. Joe Caddick. Mr. Caddick is not actually a showman, but he owns a van, and we are quite ready to assume that he is guilty of dark deeds therein, and that his doings are often illuminated by a lurid light. He is, in fact, a travelling photographer, and, like most photographers, would object to the intrusion into his premises of any myrmidon of the law, unless, indeed, he came to have his portrait taken, and paid for it like a man. We sympathise with Mr. Caddick and all his friends. To brand any one class of human beings, who work hard for their living, as dangerous and immoral, is silly and immoral in itself, and Mr. Smith would do well to bottle up his zeal for a better purpose.

Many different media have from time to time been advocated for filtering white light for photographic purposes, and rendering it innocuous to the sensitive chemicals employed in the art. Glass naturally stands first, but it is sometimes difficult to get the safe colour required, and its brittleness is always objectionable. Paper stained with aurine is good for a certain time, but its colour quickly fails, like that of so many of the aniline dyes, if it be subjected to exposure to daylight, as it is bound to be if used to protect an ordinary window. Stained gelatine has also been used, and so has in recent times coloured celluloid; but the latter preparation, on account of its inflammability, cannot safely be employed for a dark room lamp. Bookbinders' cloth, which forms the basis of the well-known ruby medium, is perhaps the most satisfactory of all.

---

We have lately found a new material in the stained transparent paper which is sold for window decoration, as an imitation of coloured glass. This can be obtained in plain red, and is readily attached to the glass of a window by means of a gelatinous cement sold for the purpose. The colour of specimens which we have seen is a full ruby red, and, when that colour is desired, might be safe if a double thickness were employed. A similar material can be home-made, if preferred, by staining a thin paper with aurine or any suitable dye, and afterwards making it transparent with varnish; gum dammar in benzole, which dries in a few minutes after application, would be a good varnish for the purpose.

---

Lamps for dark rooms are infinite in their variety, but, up to the present, cannot be said to be quite perfect. M. Radiguet, a well-known electrician, has called in the assistance of electricity, and in *La Nature* describes a little apparatus which seems to possess many excellent qualities. The apparatus is formed of a glass jar, containing three bichromated divisions. The zincs are so fixed that it is easy to change them when worn out. The reflector attached to the incandescent lamp is mobile, and turns on an axis sending the light in the direction of the ground, and, by so doing, lighting the sink during the process of development. The reflector is furnished for photographic operations with a mobile lens of red glass. This lens may be changed for one of another colour, or done away with altogether if the lamp is only required for ordinary use. To obtain illumination, one has simply to dip the plates in the bichromate divisions, and light comes immediately. The light is extinguished, of course, by removing the plates. M. Radiguet has given to this dark room lamp the rather formidable name of "electrophotophore."

---

Photographers, as a rule, are scarcely attentive enough to the nature of the books which they place in the hands of their sitters. A powerful magnifying-glass sometimes makes some curious revelations. For instance, we heard recently of a case of an extremely devout divine who was taken apparently meditating over the tome he was reading. Naturally one would suppose it was some good book like Jeremy Taylor's "Holy Living and Dying," Whiston's "Commentaries," or the writings of the early fathers. The magnifying-glass, however, revealed the unfortunate fact that the book which was engaging the attention of the good man was nothing less than a quarto edition of the plays of Wycherly, Congreve, and Farquhar. Perhaps the best book to have handy is a volume of *Punch*. It is, at least, more entertaining to the general sitter than Sturm's "Reflections," or Harvey's "Meditations among the Tombs," samples of a class of book sometimes dedicated to the studio.

*Apropos*, a photograph of President Lincoln, which was highly popular, and was sold by thousands, showed him with a big book on his knee, and with his little son leaning against him and looking at the volume. It now turns out that this book, which was always thought to have been a bible, was nothing more nor less than a photographic album belonging to the photographer. This must have been a rather unpleasant shock to those simple-minded folk of New England who have always regarded the photograph as a sort of semi-religious picture enforcing a moral and an example.

---

The Post Office authorities have been studying the actinic values of various colours. They have discovered that the £1 postage stamp, which was formerly of a chocolate hue, was easily imitated, because the colour offered no difficulty to photography. They have accordingly decided to alter the colour to a bright green, which they believe will defy photography, and put an end to fraudulent attempts in this direction. One would have thought that the demand for £1 stamps was so extremely small as not to be worth the while of any forger to imitate them. Anyway, if there is a distinct market for stamps of this value, no doubt the ingenious forger, who is capable of taking an infinite deal of trouble, will immediately begin to make use of orthochromatic photography.

---

The bungling amateur must be a source of considerable income to the dry plate manufacturer. It would perhaps be difficult to ascertain the exact number of plates spoilt in proportion to the small number of those which succeed, but we fancy we should not be exaggerating when we say that, in all probability, the ratio resembles Falstaff's ha'porth of breath and intolerable quantity of sack. It was said recently that the Duke of Orleans, during a tour of a short time back, was very busy with his camera, and, on his return, he sent 400 plates to a photographer for development. Of these 350 or so were absolutely blanks, and the remainder hardly recognisable as scenes of any kind. The experience of the Duke of Orleans could, perhaps, be paralleled by hosts of amateurs.

---

Photography was one of the subjects for excelling in which prizes were offered at the Woman's Exhibition, held last week at the Westminster Town Hall. Considering the excellent work done by ladies in the Pall Mall Exhibition last year, the work was below that which one had a right to expect. The judges certainly had little difficulty in awarding prizes to Miss Mary C. Day for a head (described in the catalogue as two portraits), and for a second study of two heads (described in the catalogue as two groups). Mrs. Arnot was rewarded by honourable mention for two studies from life. We do not know who was responsible for the compilation of the catalogue, but it was marked by frequent eccentricities, of which the above are two examples.

## RETOUCHING.*

BY G. L. HURD.

Natural retouching may be said to be such corrective work as will be unobtrusive—supplementing only the shortcomings incidental to the process. Photography does not always render a face as we see it, and, in order to bring the picture to as close a representation of life as possible, more or less work is required to be done, and this needs no excuse. For instance, either from a slight under-exposure or heedless development, your image lacks that soft blending of lights and shadows seen in nature; the lines are hard, and a general exaggeration of the defects of the face is the result. It may be said that the most direct and effective way to remedy this is to make another negative, but there are often reasons why you had better not; you may have secured such a fine pose, and withal so pleasing and unconscious an expression—which has eluded you in every plate but that—that it makes one weary to think of renewed attempts. Perhaps the proofs have been shown, and the sitter will have that and no other. Clearly, then, you must make the most of that negative; you must coax the shadows down, soften hard outlines, and try to make the flesh presentable. It is hardly necessary to say that, when you have done your best, if you commend it to the sitter, it must be with some mental reservations regarding technical value. Still, retouching has helped you out, and made respectable what otherwise would have been wholly bad. Or supposing the exposure and development had left nothing to be desired, perhaps the skin of the subject has appeared upon the plate as an exaggeration of blemishes, or patches of colour have assumed the form of depression. Such work as will correct this is surely called for. Or, again, your sitter has a face full of angularities, which no lighting under heaven, unless accompanied by an over-exposure that will make it flat, can quite keep down to natural limits. Then the pencil is your friend again. Many people sitting in a light stronger than that to which they are accustomed will scowl a little. The expression can often be made wholly right by a little judicious softening of the lines in the lower part of the forehead. Perhaps the whites of the eyes in the photograph may appear darker than in nature by reason of a tinge of yellowness, often noticed in persons of bilious habit, or the same result may be had from a congested state of the minute blood vessels. Then it is very easy to bring back the relative whiteness by a few touches with the pencil. Other illustrations of what may be called natural retouching will readily suggest themselves to you.

Artistic retouching embraces all this and a good deal more; when elaborately done, the entire face, and even a part of the drapery, has been carefully worked over; the modelling of the face has been conscientiously preserved, the lights and shadows blended, the skin brought to a soft, textury appearance; a tendency to flatness, when present, has been corrected; a high light strengthened here and there to give a little more pronounced effect, and a general bringing of the face into tone and value has been accomplished. I need not say that a negative worked in this way can only be done by an artist.

A tremendous majority of all the negatives made in these days receive treatment of the most heroic character, and when the artist in banged hair has concluded her labours, nothing remains of the original negative but the outline. She proceeds in free and easy defiance of all the laws that govern the production of natural objects in light and shade. All the characteristics of the face go down before her ruthless pencil; wrinkles disappear, depressions are made to rise up, delicate tracings of muscles are obliterated; and when all is done, the eyes and mouth are the only features that remain intact, and they are so out of value with all that surrounds them that they appear like floating islands in a spherical sea of polished marble. I do not blame the retoucher; she works up to what is required of her, and what she is praised for doing, but this is the photographic portraiture of to-day. The highest ambition of the negative worker is to finish to a smoothness that rivals porcelain; no thought or care for the modelling, or all that subtle quality of rendering so vital to the likeness; no feeling for portrait effects—only a frenzy for a smooth, mechanical surface, and a struggle for rotundity. It is useless to remark how worthless such photographs are in the eyes of all people of artistic feeling, or even to those who seek a likeness, or how degrading it is to photography.

Well, what shall we do? The public have elected that a shining puff-ball is the *ne plus ultra* of photographic art, and the artistic world has decided that there is nothing so common and debased as portraits by photography. He who refuses to conform to the standard set up by the public will have to forego their orders. I know whereof I affirm, for I have tried it.

Still, there is a cloud in the sky, which, if no bigger than a man's hand now, is going to overcast the heavens by and bye. Already there are many people who are sick of this miserable representation, and the number might be greatly increased if men of the better class would drop their weak-kneed policy, and work for the best results instead of the most profits in the immediate present. Truth will prevail in photography as in all else.

I do not wish to be understood as inveighing against retouching, for we all know it is a great help when properly employed.

To the conscientious photographer, he who seeks to give present and permanent value to portrait work, the question of working the negative is a more serious and perplexing one.

* Extracted from a paper read at the American Photographic Convention.

---

Great Yarmouth and Eastern Counties Photographic Society.—This Society, which was started in October of last year, now musters fifty members.

The next meeting of the Newcastle-on-Tyne and Northern Counties Photographic Association will be held in the lecture hall of the Literary and Philosophical Society, Newcastle, on Friday, February 6th, at 7.30 p.m. Exhibition of 160 lantern slides by lime light.

Richmond Photographic Society.—A lecture on "Wild Animals in Captivity," illustrated by the optical lantern, is to be given by Major J. Fortuné Nott, president of the Society, at the Lecture Hall, Hill Street, Richmond, on Monday, February 16th, at eight o'clock in the evening. The proceeds are to be given to the Richmoud Hospital.

George Dawson, M.A., Ph.D.—With mingled regret and satisfaction we learn that this investigator—so well known in connection with photographic research—has been elected, on the Queen's nomination, to the Brotherhood of Charterhouse. We regret the necessity that urged him to seek refuge in the hospital, and are pleased that a home has been provided him for the remainder of his days. The record of Mr. Dawson's life-work is that of a journalist, editor, author, and lecturer on science. He attributes his present incapacity for gaining a living by work in the laboratory, or by the use of his pen, to age and serious injuries received in 1889 while stopping a run-away carriage horse.

## THE ENFIELD PHOTOGRAPHIC EXHIBITION.

Last Saturday afternoon the Photographic Exhibition of the Enfield Camera Club was opened, and in the evening a display of slides took place by means of the magic lantern. There was a good attendance on both occasions. With one or two exceptions, all the photographs exhibited were the work of the members, and of the more interest to their friends, the visitors, on that account. Among the best pictures on view were those by Mr. H. F. Knight, including views in Cumberland, seascapes, and other subjects. Some specimens of home portraiture, and views of Ely Cathedral, by a member whose modesty did not permit him to attach his name thereto, were of merit. Mrs. Henry Bowles exhibited a good photograph of a couple of swans, vignetted, but the background was not one well suited for a vignette picture. Among other exhibitors were the Graphotone Co., Messrs. W. Street, R. B. Lodge, W. H. Fellows, G. D. Pinkney, A. J. Ransome, S. James, V. Clements, F. Cresswell, J. Dudin, H. W. Stocks, and W. J. Biggs. Of course, with a proportion of new amateurs and a somewhat newly-formed club, some of the pictures mixed up with the good ones in the exhibition were chalky, others flat, and others without natural clouds; but the gathering was a friendly and social one, not intended for much outside criticism, and it gave pleasure to all who attended.

In opening the proceedings,

Mr. G. D. Pinkney, the president of the Enfield Camera Club, said that the organisation had been established for about nine months by a few individuals in the neighbourhood who were interested in photography. The Club held fortnightly meetings, at which papers were read, demonstrations given, and mutual information afforded. The Club had ladies among the members, and two of them were exhibitors.

Captain Henry Bowles, M.P., stated that he had great pleasure in attending to open that exhibition of works of art produced by residents in Enfield and its neighbourhood. He had a little to do with photography himself, because his wife had taken to playing with the subject, and he was the poor victim. He felt afraid to attend a meeting like that, lest somebody should be taking shots at him by means of a button-hole camera. Of late years photography had made great strides; it had produced wonderful pictures for the weekly papers and for one issued daily, so that people at a distance could gain a better idea of passing events; it had also been of great help in different branches of science. The medical profession, by its aid, obtained pictorial records of interesting cases, and astronomers had made great discoveries by means of photography, although once or twice it had led them astray, and produced two stars where there had really been but one. Photography had been much advanced by amateurs, for new discoveries were more likely to be made by those who followed it for pleasure than by those who pursued it more in beaten tracks as a business. He congratulated them upon their exhibition, and had pleasure in declaring it to be open.

Dr. F. Cresswell remarked that Mr. Bowles had spoken of photography as a science, but the members also wished it to be artistic, and that was one of the chief reasons for the recent formation of numerous clubs and societies all over the country.

After a few remarks from Mr. J. Dudin, those present proceeded to inspect the photographs.

---

Colouring Brass.—A steel colour is developed on brass by using a boiling solution of arsenic chloride. A concentrated solution of sodium sulphite causes a blue colouration. Black, as on optical instruments, is obtained from a solution of platinum chloride, to which tin nitrate has been added. In Japan, brass is bronzed by using a boiling solution of copper sulphate, alum, and verdigris.—*Invention.*

## THE WATER-COLOURS EXHIBITION AT PALL MALL.

The Gallery at 5a, Pall Mall is, in the minds of many photographers, so intimately connected with the yearly show of the Photographic Society, that seeing those walls covered with rainbow tinted water-colour drawings comes to some almost in the light of a revolution. This is, however, a limited and photographic view of the matter. The Royal Society of Water-Colour Paintings has now on view its twenty-ninth winter gathering, and an interesting and instructive collection it is.

Close by the door we find (No. 2) "The Valley of the Mawddach," by G. A. Fripp, a picture of considerable merit, warm in colour, broad in treatment, without excess. Close by is the first of many from the brush of Birket Foster, viz., (No. 6) "On the Rocks, Arisaig"; others from the same brush are (No. 49) "Isle of Rum," (Nos. 74 and 82) "Crofters' Cottages with Children," (No. 95) "Waiting for the Boats," a charming picture, (Nos. 154 and 178) "Children and Cottages"; but among them all, let the photographer carefully study No. 95 for composition, gradation, harmony, and design.

No. 13 is a large, clever picture, "First Breath of Autumn," T. Lloyd; possibly the thistle-down is a trifle heavy and solid, but the general result is decidedly good. No. 18, "White Cottage," is of the out-of-focus order, and is more curious than beautiful.

No. 26, "Gate of Justice, Alhambra," E. A. Goodall, is a valuable lesson to photographers in the matter of transparency with quiet detail in the shadows. It is the black, solid, heavy shadows of the ordinary photograph which so much offend painters. Nos. 23 and 42 should be noted as approaching somewhat in this direction; they are of what is sometimes called a blot-esque tendency.

Sir John Gilbert's study for a larger picture (No. 30) is interesting. No. 37, "Sculling," F. Powell, is a fine study in cloud reflection in water, a result difficult to attain in the camera. No. 46, "Loot," C. Robertson, is "very fine and large," a foreground with a superabundance of properties highly coloured. Another large picture (No. 56), "Haymaking," by A. Hopkins, has some fine parts, but the figures are rather wax-like in complexion as compared with ordinary haymakers. No. 70, "Low Tide," is an example of how to select a point of view and "make a picture out of nothing." No 81 is called "Scotch Fishing Boats," and is a view of Whitby Harbour; the only boats with harbour marks visible are N.S. (North Shields) and H (Hartlepool.) No. 88 is an exceedingly clever study of cattle and snow; No. 116, another of C. Robertson's clever oriental pictures. No. 110 is a cloud study of the rough style; No. 118, "Sandhills," and interesting to photographers as being rather a fashionable camera subject last year. Nos. 129 and 175, pastel portrait studies, which show the effect of having the head "too high up on the plate."

Henry Moore's "Prawners" (No. 142) is not so pleasing as some other of his handiwork, but close by is the gem of the show (No. 144), "Venice," by Miss Clara Montalba. The picture is a poem, or rather a beautiful dream of air, light, water, all palpitating with a mysterious life; note how the colours have been massed and grouped. From the same brush we have some others, No. 258, "Riva," No. 343, "Grand Canal," No. 367, "Rialto," and No. 292, a glorious flood of golden light, such as would have filled the soul of Turner with joy. No. 151, "Lower Valley of the Esk," should be studied to see how plane melts into plane.

No. 167, "The Jolly Miller," by H. Stacy Marks, is one of the few figure studies, pure and simple; it is simple, and yet strong in its simplicity. On the screens may be seen two bird studies (Nos. 294 and 309) by the same master. Sir Oswald Brierly, marine painter to the Queen, sends several masterly pictures and sketches. No. 172, "Waiting for a Breeze," a Venice sketch in his usual able style; No. 179, another Venice picture, broad, simple, and grey; No. 257, six small water and cloud studies; No. 333, Lowestoft boats; No. 345, H.M.S. *Meander*, a vessel in which the painter visited many foreign lands on a sketching tour, including Mexico, Peru, and Tongatabu.

No. 181, "Yarmouth Marshes," Henry Moore, is a beautiful painting. No. 185, "Stromboli," Albert Goodwin, a large and dramatic work, with some rather startling colour. No. 193, David Murray, shows the powerful effect of converging lines; a fine study in composition of line for photographers.

No. 204, "Country Girl," by Miss C. Phillott, a good example of ideal painting. Walter Crane sends the four seasons in design, Nos. 234-5, 247-8—splendid studies of graceful line. No. 241, "Wreck of the Halswell," is of course of the sensational order. Walter Crane sends several paintings of places dear to the camera man who "does" the south coast, *e.g.*, Nos. 261 and 265, Winchelsea Strand, and Gatechurch; nevertheless we prefer his beautiful designs. H. G. Glindon sends several character and figure studies (Nos. 232, 253, 278, and others), all in the same semi-French, vignette style, undoubtedly clever, yet not altogether satisfactory. Miss Edith Martineau paints a farm lad and his dog, "A Happy Couple" (No. 271), surrounded by appropriate buildings, in a skilful and satisfactory manner. Some of the lighter tones are perfect in gradation and luminosity. E. A. Goodall, in No. 295, scores decidedly in the happy hunting ground of painters, viz., Venice, and again in No. 363 a similar success is attained.

No. 303 is a curious and equally interesting monochrome allegorical study by Holman Hunt, showing a double rainbow. H. M. Marshall contributes a pleasing study of Whitby (No. 307); also a satisfactory view from London Bridge (No. 317).

On no account must the student omit to notice several highly characteristic black-and-white drawings from the pen of G. Du Maurier, viz., Nos. 350, 352, 357, 362, noting especially the well-known mouth and eyebrow in the two latter. A small black-and-white study by A. Hopkins, No. 353, is one of the cleverest things in the room.

There are many, many other pictures which every photographer should study in this room, even if he only were to learn from them a lesson which is sadly wanted in many quarters, viz., variety of subject. There is perhaps more sympathy between photographers and water colour workers than between the former and workers in oil medium.

This room shows that the general tendency of water-colour workers is towards the same class of subject which is most within the scope of the camera man—viz., landscape, with or without figures as part of and belonging to the scene. Another hint may also be taken from a gathering of pictures like this—viz., to glean information about some new, unexplored districts where food suitable for the camera is likely to be found. It is time that photographers gave Conway Castle its well-earned rest.

## PARLIAMENTARY ACTION IN RELATION TO THE DECIMAL SYSTEM.*

BY J. EMERSON DOWSON, M.INST.C.E.

For some sixy years or more the question of having a decimal system of coinage, weights, and measures in this country has received more or less attention, and several public inquiries have been held; but I venture to say that the subject has not been dealt with as comprehensively and as exhaustively as it deserves. So long ago as 1841, when the Houses of Parliament were destroyed by fire, the Commissioners appointed, in consequence of the destruction of the standards of weights and measures, referred incidentally in their report to the advantages of decimal coinage, weights, and measures; and, two years later, a new Commission referred to and confirmed this opinion. In 1853, the appointment of a Select Committee to enquire into the whole subject of decimalising moneys, weights, and measures was proposed; but, unfortunately, its scope was limited to moneys only when the appointment was made. This Committee reported strongly in favour of a decimal coinage, and recommended what is known as the "pound and mil system." In 1857 a Royal Commission was appointed to consider the introduction of a decimal coinage; and, in their preliminary report, the Commissioners said that the question of decimalising the weights and measures was early forced on their notice, but that they could not deal with it, as the terms of the Commission "restricted their investigations to the practicability and expediency of introducing the decimal principle into the coinage of this country, without contemplating any change in our present system of weights and measures." In their final report, two years later, they were, however, so far impressed with the intimate connection between the weights, measures, and coins, that they remarked:—"It does not appear desirable, under existing circumstances, while our weights and measures remain as at present, and so long as the principle on which their simplification ought to be founded is undetermined, to disturb the established habits of the people with regard to the coins now in use, by a partial attempt to introduce any new principle into the coinage alone." This was the last inquiry into the coinage question; but in 1862 a Select Committee was appointed to report on "the practicability of adopting a simple and uniform system of weights and measures." They reported strongly in favour of the metric system, but, incidentally, the question of decimal coinage was forced upon them; and they added in their report that "the evidence they have received tends to convince them that a decimal system of money should, as nearly as possible, accompany a decimal system of weights and measures," so as to obtain the greatest advantage.

All the seventy-two Chambers of Commerce of the Association of the United Kingdom have repeatedly pronounced themselves in favour of the decimal system, and the four large Chambers which are not members of the Association (Edinburgh, Glasgow, Liverpool, and Manchester) have taken the same ground. At the last meeting in March, 1890, the Association resolved "that a deputation be appointed to wait upon the Vice-President of the Committee of Council for Education to urge that steps may at once be taken to make the study of the decimal system of coinage and weights and measures a

*A portion of a paper on the Decimal System read last Wednesday night at the Society of Arts.

compulsory subject in all public elementary schools." Effect was given to this on June 16th, when an influential deputation waited on Sir W. Hart-Dyke, who acknowledged the importance of the body which the deputation represented, and of the subject under consideration. He said that he had long been in favour of such a system, and that they had his most cordial sympathy as far as the general policy was concerned. He thought his department would not be able to carry out the suggestions of the delegates before the system was legally authorised, but that, bearing in mind that the education given to the children must not only be the best, but the one most immediately suitable to their welfare, progress, and success in life, he would be glad if, in the future, he were enabled in any degree to forward the objects the deputation had in view.

## Patent Intelligence.

### Applications for Letters Patent.

1,400. J. B. King and J. Bickle, "Combination Cameras and Lanterns."—January 26th.

1,450. M. Johnstone, 104, Queen's Road, Hastings, "Cameras."—January 27th.

1,507. N. Lazarus, 8, Quality Court, London, "Lenses."—January 27th.

1,528. C. W. Cox, 8, Lord Street, Liverpool, "Cooling Magic Lanterns."—January 28th.

1,583. A. Gray, 53, Chancery Lane, London, "Producing Names, Numbers, or Description on Photographs."—January 28th.

1,590. W. W. Horn, 151, Strand, London, "Diaphragm for Cameras." Lyman G. Bigelow, Unitsd States.—January 28th.

1,621. J. B. Brooks, 115, Great Charles Street, Birmingham, "Clip for Holding Photographic Printing Frames."—January 29th.

1,632. T. Tulloch, 64, Church Street, Inverness, "Glazing Roofs without Sash Bars or Putty."—January 29th.

1,736. O. Imray, 28, Southampton Buildings, London, "Photographic Developers." The Actien Gesellschaft fur Anilin Fabrikation, Germany.—January 30th.

1,793. F. J. Upton and G. Stephens, 433, Strand, London, "Photo-Mechanical Colour Printing."—January 31st.

### Specifications Published.

3,203. *February 28th*, 1890.—"Coating and Tinting Glass Surfaces." Charles Leigh, 128, High Street, Homerton, London, Artist.

This invention relates to a process of coating and tinting glass surfaces for the reception of paintings or other decorations. Although any glass surface may be treated, I have found that my process is particularly applicable to opal glass, which heretofore, so far as I am aware, has never been tinted, and any colour applied to its surface has had to be burnt in.

In carrying out my process, I roughen the surface of the glass to be treated by grinding or in any other suitable way. I then apply the coating, consisting of suitable gums and a solvent, preferably fusel oil. Any suitable colours are then applied to the coat, and are fixed on by any of the well-known mordants, such as chloride of tin, acetate of alumina, tannin, and the like. When I employ alcoholic solutions these mordants can be entirely dispensed with. I have found that a solution formed of the following ingredients gives satisfactory results, and for this purpose I dissolve 3 ounces of shellac, 1½ ounces of sandarac, 1½ ounces of mastic, 1½ ounces of benzoin, in 1½ pints of alcohol. I then add 1¼ ounces of Venetian turpentine, and after the whole has dissolved the solution is filtered and an aniline dye, either vegetable, mineral, or other dye, but preferably vegetable, soluble in alcohol, may be added.

I have also found that four parts of shellac to one part of borax dissolved in boiling water will make an excellent coating.

Good results may also be obtained if one part of shellac (or any other gum soluble in alcohol), dissolved in four parts of alcohol, be applied to the surface and immersed in a solution of aniline dissolved in boiling water with any of the well-known mordants. The coating can be applied to glass by a brush, rag, or other suitable means, or it may be floated upon the glass, or the latter may be dipped or immersed in the coating solution.

By means such as described, I am able to produce a tinted opal glass of any shade of colour, which will not only keep its colour and remain unaffected by atmospheric changes, but is also capable of being washed without being in any way damaged or affected.

3,392. *March 4th*, 1890.—"Detective or Hand Cameras." Walter Griffiths, Highgate Square, Birmingham, Manufacturer.

The object of this patent is to promote cheapness in hand cameras, and it describes one made of millboard.

3,482. *March 4th*, 1890.—"Photographic Cameras." Louis Van Neck, Brussels, Belgium, Merchant.

This invention relates to photographic cameras. The camera constructed according to the said invention has the appearance of a case covered with leather, and presents in front two circular openings, one being designed for the objective, and the other for the sighting.

At the upper part of the camera is arranged a handle for the transport, and a square opening provided with a deadened glass protected by a spring actuated shutter.

The camera possesses at its lower part a rectangular opening likewise provided with a deadened glass masked by its metallic shutter; the lever of the obturator having an exterior helical spring which can be detached at will, and expanded so as to act upon a series of tappets, and a knob provided on a rack designed for the focussing. On the side of the apparatus is arranged a presser of the disengaging device.

The camera has at its rear a closing device operated by a spring, which device enables a portion of the cover to be removed, and the bag which serves for changing the plates, or films, or the key of the roller frame to be uncovered or laid bare; furthermore a metallic handle, and an opening for the numbering frame.

My improved apparatus is composed of two distinct parts, one being fixed, and the other removable. The latter part includes the portion of the cover hereinbefore referred to. The anterior fixed part is formed of a reservoir upon which is placed in front the objective actuated by the rack for the focussing, and immediately preceding the obturator, having a mirror which exactly closes the opening on the side of the chamber for the plates or films placed behind. Above, the deadened glass is at the exterior, and reflects the image produced by the objective. A number of levers actuated by springs enables the obturator to be put under tension without uncovering the opening of the chamber towards the sensitive plates or films. At the moment of the disengagement, the mirror is raised and lowered with a velocity corresponding to the tension of the springs acting upon the levers. For prolonging the exposure, the obturator can be manipulated through the medium of a string or the like.

The posterior fixed part of the apparatus comprises a chamber which can hold, say, from twelve to thirty sensitive plates or films possessing frames of metal, celluloid, or other light material. Use can also be made of a roller frame having, say, from forty-eight to one hundred sensitive plates or films.

After each exposure the sensitive plate or film can be changed by means of a key; or giving a quarter of a turn to the handle at the rear, the last frame holding the sensitive by plate or film is raised in the impermeable bag in such a manner that the operator can seize it, and easily place the same before the others without fear of making a mistake. At the same time the numbering disc is caused to advance through the distance between two notches, and in the opening provided for this purpose appears the number corresponding to the figure indicating the number of plates or films used. In like manner a hand shows upon the roller frame the number of turns imparted to the rollers.

3,571. *March 6th*, 1890. — "Flash-Lamps." Robert Slingsby, 168, High Street, Lincoln, Photographic Artist.

In taking photographs by the aid of what are known as flash-lamps, difficulty has heretofore been experienced in effecting the release of the instantaneous shutter of the photographic cameras and the discharge of the flash-lamps simultaneously, in such a manner that the said shutters shall be open (for, say, one-tenth or less portion of a second, for example) during a fraction of the time in which the flash-lamps are illuminating the object to be photographed, which fraction may be, say, one-half of a second, for example ; and this difficulty occurs especially when it is required to discharge a number, or a battery, as it is technically called, of flash-lamps, and a number of corresponding photographic shutters at the same time.

The object of the present invention is to obviate the aforesaid difficulty by providing an apparatus whereby the release of the shutter or shutters, and the discharge of the flash-lamp or lamps, can be effected and controlled in such manner that the opening and closing of the shutter or shutters shall take place during the time the corresponding flash-lamp or lamps is or are giving its or their illuminating effect, the two operations of opening and closing the shutter or shutters, and of discharging the flash-lamp or lamps, being effected by one and the same mechanical movement.

For this purpose I employ a bellows connected by tubes with the flash-lamps to be discharged ; this bellows is actuated by a lever or other suitable device. The india-rubber ball, or other suitable device for releasing the shutters, is also connected by a tube or tubes to the shutter releasing apparatus of the camera or cameras, and is secured in position in the apparatus now being described in such manner that the same lever, or other instrument, that operates the lamp discharging bellows, also acts directly or indirectly upon and squeezes the said india-rubber ball. It will now be understood that, on actuating the aforesaid lever, or other instrument, the bellows and india-rubber ball are both operated upon at the same time, and, consequently, the flash-lamps connected with the bellows are discharged, and the shutters connected with the india-rubber ball are released at the same time also.

In order to provide for the necessity, which sometimes arises, of causing the shutters to be released at an earlier or later instant of time with reference to the moment of discharge of the flash-lamps, I provide adjustments whereby the lever or other actuating instrument is caused to act, sooner or later, on either the shutter releasing ball or on the flash-lamp discharging bellows, as may be desired.

The tubes connecting the flash-lamps to the bellows may be coupled to the latter in any suitable way, but I prefer to employ a nozzle connected directly to the bellows, of a diameter suitable for the greatest number of lamps the bellows is capable of supplying ; to this nozzle may be applied connecting pieces with apertures proportioned to suit the tubes of any number of lamps it may be desired to employ. I also sometimes connect the tubes from the flash-lamps to the bellows by means of a junction piece or distributor, consisting of a hollow box shaped somewhat like the rose of a garden watering-pot, and having short nozzles fixed in the side thereof corresponding to where the perforations are usually made in that article. The tubes from the lamps are connected to the said short nozzles, and the junction piece or distributor is connected by a suitable pipe to the bellows. Any desired number of these junction pieces or distributors may be connected by branch pipes to the main pipe leading from the bellows.

The employment of one or more of these junction pieces or distributors tends to equalise the pressure of air in the various tubes leading to the lamps.

3,730. *March 8th*, 1890.—"Machine Cameras." Mortimer Evans, Savile Club, Piccadilly, London, Civil Engineer.

This invention relates to certain improvements in or applicable to photographic cameras of the kind described in the specification accompanying application for Letters Patent No. 10,131, dated the 21st day of June, 1889, made by William Friese Greene and myself, in which cameras the consecutive movements necessary for the obtainment of a latent photographic representation, or of a series thereof, are caused to be effected automatically, and, if required, in rapid series, by means dependent for their actuation upon the rotation of a common shaft or its equivalent (hereinafter referred to as the "main shaft"), to which motion may be imparted by any suitable means.

The objects of the present invention are to simplify the means by which the successively adjacent or following portions of a sensitised strip (upon which successive or following representations are taken) are caused to be presented in position for exposure, arrested in position during exposure, and removed from position after exposure, and to lessen the period of each arrestment of the slip, so as to allow of, and cause the strip to be more gradually advanced into and from such position between its successive times of arrestment.

To this end, I cause the advance of the strip to be effected directly from the main shaft, or by parts operated thereby, in lieu of causing such advance to be effected by intermittently operating escapement devices independently and momentarily operating when released from the control of such shaft, as described in the aforesaid specification.

In such lastly referred to means, the portion of the strip in position for exposure is stationary during the whole, or nearly the whole, of the period between the successive operations of the escapement device, and the strip is momentarily shifted ; but by the present improvements, the portion of the strip in position for exposure is arrested in position only for the period required to effect the exposure, and the whole of the period between such successive times of arrestment is utilised in shifting the strip so that it is more gradually advanced.

I can effect this object by various modifications of suitably arranged devices.

According to one modification, I mount a take-up roller and a winding-on roller in opposite side rocking levers on the pivot or connecting spindle, of which I mount a roller guiding the strip from a suitably mounted let-off roller in alignment for exposure to the take-up roller, partly around which the strip passes on to the winding-on roller ; and I drive the latter by a frictional hub, and by connecting gearing from the spindle of the take-up roller at a relatively higher speed, such as may be practically most advantageous, such parts being so arranged as that the motion of the several rollers, and, consequently, the advance of the strip, is dependent upon the motion of the take-up roller. I impart the necessary movement to this latter roller from the main shaft (which may be continuously rotated) by driving it by frictional surface contact with a drum on such shaft, and I cause such movement of such roller to be intermittent by disconnecting such roller and its actuating drum at the time the arrestment of the strip, and the exposure thereof, is required to be effected. I can also effect this object by various arrangements of suitable means, as, for example, by mounting a pin or pins in the ends of the said drum, and by mounting disconnecting spring or gravity levers in arms extending from the said rocking levers, so constructing and arranging such disconnecting levers as that they will be automatically actuated by the said pin or pins at the times required, so to be caused to be effective in rocking the levers into position, and holding the strip in position for and during exposure, and until (immediately after the exposure) the actuating pin passes beyond the range of the disconnecting levers, which thereupon fall, or are caused to fall, into position ready for the next actuation of the pins, the take-up roller and its actuating drum being simultaneously automatically thrown into gear by a suitably disposed spring acting upon the rocking levers.

According to another modification, the winding-on roller is applied directly to the main shaft, being driven frictionally from the hub. Its winding-on and advancing action on the strip is caused to be arrested when required, as aforesaid, by pins or discs connected to the shaft, which intermittently engage with a conveniently mounted brake-lever, and cause the same to arrest the strip by nipping it against an opposite fixed part until the pins have passed beyond the range of the brake-lever, when the latter is automatically released by a spring, and the rotation of the roller and advance of the strip proceeds.

According to a further modification, the take-up device consists of a pair of rollers between which the strip is passed, and which receive a continuous feeding motion from a drum mounted on the main shaft, and are mounted in rocking arms, which, by a suitable arrangement of actuating parts, are caused to receive a reciprocating traversing motion equal to the speed of rotation of the rolls. Such means are effective in causing the rollers in their backward traverse (during which the portion of the strip in position for exposure is required to be stationary) to roll over the strip without effecting any movement thereof, and in causing the rollers during their forward traverse both to roll forward and to pull forward the same amount of strip, the strip being consequently advanced equal to the sum of the gathering motion of the rollers plus the traversing motion of their carrying levers.

19,488. *November 29th*, 1890.—"Adjustment for Photographic Objectives." ERNST GUNDLACH, 112, South Ave., Rochester, State of New York, U.S.A., Inventor.

My invention relates to such photographic objectives or lenses which are to be used with different openings or diaphragms according to light, distance of object, angle of field, and other circumstances. Such objectives are most generally composed of two achromatic lenses which are mounted rigidly on to the ends of a tube, and in such a distance from each other as is most favourable to the special purpose of the objective, the diaphragm being situated about midways between the lenses.

Such most favourable distance of the lenses, however, varies considerably with the diameter or opening of the diaphragm used, and also with the angle of field to be embraced by the objective. For instance, in landscape lenses, which require a wide angle of field, and are mostly used with small diaphragms, the best photographic result is obtained with a comparatively short distance of the lenses from each other, or from the diaphragm, while in portrait lenses, which have a much smaller angle of field, but are generally required to work with comparatively wide openings or large diaphragms, the distance of the lenses is to be correspondingly great, in order to produce the least possible focal distortion at or near the edges of the picture.

In fact, if the distance of the lenses is so regulated that the objective will, with a small diaphragm, produce the best possible picture, it will work very unsatisfactorily with a large diaphragm, producing a curved field, and much distortion at the sides. If, however, the lenses are brought farther apart, so as to have the most favourable position for a large diaphragm, then the picture produced with such will certainly show considerable improvement, while, on the other hand, it would then be much inferior if a small diaphragm were used.

A similar relation exists between the angle of field and the distance of the lenses. The wider an angle the objective is to embrace, the nearer the lenses must be brought together, or to the diaphragm, not for the immediate purpose of widening or increasing the angle of said objective, as is actually done thereby, to some extent; but to reduce the distortion at the sides, and the aberrations in the flatness of the field, which certainly increase with the angle. Thus, a short distance of the lenses will adjust the objective for small diaphragm and wide angle, and a long distance for large diaphragm and narrow angle at the same time.

Furthermore, if the object is very near to the objective, and the diaphragm of the latter is large, as is, for instance, generally the case with the portrait objective, then the proper or most favourable distance of the lenses of the objective also varies considerably with the distance of the object, and still more with the difference of the distances of different parts of the object, if those parts forming the centre of the picture have another distance than those near the edges. If, for instance, a person is to be taken in a sitting position, the hands are usually much nearer to the objective than the face, and consequently, if the image of the latter appears sharply defined on the focussing screen, the hands will be out of focus, the latter being too long, and lying behind the plane of the image. Provided, then, the image of the hands to be near the edge, and the face at or near the centre of the picture, the defect could be remedied by bringing the lenses of the objective nearer together, in order to shorten the oblique focus or that which forms the image of the hands. Thus, in this particular or exceptional case, a shorter distance between the lenses than that most favourable for general purposes would be proper.

The object of my invention is to provide for suitable means of conveniently varying the distance of the lenses of the photographic objective from each other or from the diaphragm at will, so that the same may be expressly and accurately adjusted for any size of diaphragm, and also for any angle of field or size of picture, if required, or, as in the case of the portrait objective, for any distance of object or difference of distances of different parts of the object.

## Correspondence.

### THE NATIONAL PHOTOGRAPHIC EXHIBITION.

SIR,—I am requested by the directors to inform you that the National Photographic Exhibition will be held at the Crystal Palace from the 13th April to the 2nd May inclusive.

S. G. BUCHANAN WOLLASTON.

*Crystal Palace Company, Crystal Palace, S.E., January 29th.*

### THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

SIR,—The annual general meeting will be held on Tuesday, February 10th, at 8 p.m., at 50, Great Russell Street, W.C.

No paper will be read at this meeting, which will be devoted to the consideration of the report of the council, the treasurer's report, the election of a new council, and other general business.

Members who wish to raise any question as to the management of the Society in any particular, are requested to bring the matter forward at the anniversary meeting, and it would be a convenience if notice were sent to the assistant-secretary of any motion which it is intended to propose.

The Progress Medal will be presented to Lieut.-Colonel J. Waterhouse. A. M. MANTELL, Captain R.E., Hon. Sec.

50, *Great Russell Street, W.C., January* 31*st*, 1891.

### THE PHOTOGRAPHERS' ASSISTANTS UNION.

SIR,—Will you oblige me by inserting the enclosed in the columns of the NEWS. ARTHUR FIELD, *Gen. Hon. Sec.*

*Maidstone.*

*Fellow Craftsmen and Lady Assistants.*

Now that we have, by a meeting in London, laid the foundations of a trade-union in photography, we beg to place our main proposals before you, subject to amendment by future meetings of the committee.

Roughly speaking, we appeal to all workers in the craft (male and female) of all grades of work, to unite for the purpose of safeguarding present trade privileges, and of mutually avoiding establishments notoriously unfair to their employées. In order that want of employment may not cause our members to accept or offer unfair terms of engagement, we intend to pay to all members of six months' standing "benefits" of from 8s. to 15s. per week. The payments for membership are arranged in classes according to the salary received, and range from 4d. to 8d. per week.

We do not intend to start on a "squelching" or other aggressive movement. We simply unite to refuse to accept engagements under sweaters and swindlers.* As for the good employers, we shall be pleased to act with them wherever they will allow us.

In return for fair treatment we offer *qualified labour.* We shall guarantee our members' ability by requiring them to have been for eight weeks continuously (at some date within two years of application) in receipt of at least the following wages:

*Minimum Salary to Admit.*—Operators or retouchers (or both), West-end of London, 40s.; East, 30s.; other parts, 35s. Printers (silver), West, 27s. 6d.; other parts, 20s. Lady

[* With present conditions we know of no law compelling a man to accept service under swindlers.—ED.]

retouchers and other artists, West, 30s.; other parts, 15s. Reception-room duties, 15s. and 10s. respectively; carbon printers, 30s.; monochrome artists, 40s.; photo-processes (operators, printers, etchers, photo-litho artists), 40s.; retouching, redrawing, opening-up, &c., 35s. Special arrangements for piece workers and workers in season towns. Membership restricted to workers under 40.

The above figures are subject to early amendment. Our work cannot be carried on without expenses, and the primary expenses will be the heaviest. Therefore we trust the necessary monetary aid will be forthcoming from all who have any interest in the new departure. All donations to be sent direct to H. Snowden Ward, treasurer, Bradford, Yorkshire.

We need hardly repeat the urgency of this question. However sure one may feel of the permanency of situation, yet unexpectedly it often happens that one is thrown suddenly into a helpless position—helpless because *isolated*. To prevent this we have started this movement for unity and mutual help. Let "Organisation" be the watchword of our disunited workers; let "Moderation" be our policy, and "Defence, not Defiance," our motto.—T. Bolas, Chiswick (*President*); H. Snowden Ward, Bradford (*Treas. and Sec. for Bradford*).

*Committee* (London)—W. Goebelhoff, G. J. Nield, Napier, Krauss, Phillips, Forbes. *Hon. Secretaries*—G. Nield, 44, Englefield Road, London, N.; F. Mann, 175, Malpas Road, Brockley, S.E.; C. Harrap, 8, Victoria Road, Plymouth Grove, Manchester; Arthur M. Henderson, 42, Frederick Street, Edinburgh. All information from Arthur Field, General Hon. Sec., Maidstone.

---

## PHOTOGRAPHY AND ILLUSTRATED JOURNALISM.

Sir,—The very interesting article on page 84 of your last issue entitled, "Photography and Illustrated Journalism" concludes with this sentence: "Mr. Russell Scott described a newly invented method of producing pictures of *various colours* at a rapid rate with *one impression from a single lithographic stone or block*." The italics are my own, as these few words seem to point to the solution of a problem that chromo-lithographers so far have completely failed to solve, and foreshadows a revolution in the cost and rapidity at which coloured reproductions can be turned out. If Mr. Russell Scott could be induced to give some farther particulars concerning this invention, they would, I think, be highly appreciated by those of your readers who, like myself, take an interest in all process work, and to the very large number who find that the photographic work connected therewith adds considerably to their income. M. P.

*February 4th*, 1891.

---

The Exhibition of the Manchester Photographic Society will open next Monday.

To-night Lord Rayleigh will lecture at the Royal Institution on "Some Applications of Photography."

Various correspondents are constantly sending us newspaper cuttings about the doings of those photographers who advertise "portraits for nothing," and then get something for them under the guise of charging for the frames. As all photographers have heard of the humbug, our correspondents had better send the paragraphs to local newspapers which have not already printed the particulars.

Pyrocatechin.—The recent decrease in the price of pyrocatechin is bringing it into prominence as a developing agent. The formula below is simple, and is said to produce excellent negatives:—

| | |
|---|---|
| Pyrocatechin ... ... ... ... | 1 gramme |
| Carbonate of potash ... ... ... | 10 ,, |
| Distilled water ... ... ... | 60 to 70 c.c. |

Another Discovery in Photography.—An interesting discovery has been made by Herr Dombeznfki, of the Lemberg Polytechnic Academy, Vienna, by which the area of the usefulness of photography is still farther extended. The professor, who has made a report to the Vienna Academy of Sciences, says that he has succeeded in obtaining photographic effects by electro-magnetic undulations, and explains the means he has employed.—*Photographic Times*.

# Proceedings of Societies.

London and Provincial Photographic Association.

*January 29th.*—Mr. A. Haddon in the chair.

Mr. W. E. Debenham presented to the library a work on the Autotype process.

Mr. Charters-White read a paper on "Photo-Micrography" (see page 102).

Mr. J. J. Briginshaw said that in order to facilitate the adjustment of objectives to the object to be photographed, he had devised a turn-table, which carried the microscope. He had found it a very convenient arrangement in practice.

Mr. T. E. Freshwater exhibited a lantern attachment, the use of which dispensed with the ordinary microscope. A revolving diaphragm plate rendered the light quite under the control of the operator. He also passed round Mr. Pringle's work on the subject.

The Chairman, in reply to questions, said that he did not recommend the use of the eye-piece; it restricted the field. With regard to the bull's-eye condenser, in his hands it had proved a very useful accessory. He had tried a yellow screen, but did not find any material gain from its use. For focussing he used a piece of plain glass with lines ruled across it with a diamond.

Mr. J. J. Briginshaw said that the ordinary ground glass screen was of no use whatever for fine work. A very good screen could be made by simply flashing a gelatine plate to light, and developing it.

A series of micrographs was then projected on the screen with the optical lantern, the work principally of Mr. Guardia and Mr. T. E. Freshwater.

---

The Sheffield Photographic Society.

The ordinary monthly meeting was held at the Cutlers' Hall on February 3rd, Mr. B. J. Taylor in the chair.

After the election of new members, a lantern exhibition was given, consisting of 180 slides, which had been awarded medals in their several classes in a recent competition.

---

The Sheffield Camera Club.

The annual meeting was held on January 28th in the Club's rooms, New Surrey Street. The Secretary's report for the past year was satisfactory.

The following were elected as officers for the ensuing year:—*President*—Mr. G. T. Newsholme; *Vice-Presidents*—Dr. T. H. Morton and Mr. H. J. Rawson; *Hon. Secretary*—Mr. G. E. Maleham; *Treasurer*—Mr. B. W. Winder; *Council*—Prof. J. O. Arnold, Drs. J. A. Munton and E. S. Rumio, Messrs. Wm. Gilley, jun., A. Copley, and P. Slater.

The Tooting Camera Club.

At the meeting held on the 27th January, with the President in the chair, the time was devoted to lantern slide making by Mr. J. F. Child.

The next ordinary meeting will be held on the 24th February, when Mr. Berger will demonstrate pyro development.

---

The Birmingham Photographic Society.

A meeting was held at the club rooms, Colonnade Hotel, on January 29th, Mr. W. J. Harrison in the chair. Eight new members were elected.

The exhibits of the evening were Hulm's cantilever enlarging apparatus, which was admired both for excellence of workmanship and portability, and two permanent photographs burnt into porcelain, which were shown by the Chairman. Neither of the latter appeared to have suffered by the burning-in process they had undergone.

The evening was then devoted to a developing competition and demonstration. Plates were first exposed behind negatives in the room, and then developed with pyro and ammonia, by Mr. J. T. Monsley; pyro and potash, by Mr. J. Simkin; hydroquinone, by Mr. G. A. Thomason; eikonogen, by Mr. A. J. Leeson; "Demon," by Mr. J. W. Pickard; ferrous oxalate, by Mr. W. J. Harrison.

The question-box contained the following question: "How are photo-etchings produced?"

The Chairman said that in principle he believed it to consist in imposing a carbon print upon a grained metal plate. A solution of perchloride of iron was then poured over the carbon picture, and this solution acted through the carbon image, biting or etching the metal beneath it. The metal plate could then be used to print from.

---

### The Croydon Camera Club.

The first annual meeting was held at the club rooms, 96, George Street, Croydon, the president, Mr. H. Maclean, F.G.S., being in the chair.

The report stated that no less than seventy members had been elected since the Society was founded on the 25th February, 1890. The accounts show a balance to the good of £16 15s. 4d.

The Club has the sole use of central rooms, open every day to members from 10 a.m. to 10.45 p.m.

The following officers were elected to serve for the current year:—*President*—H. Maclean, F.G.S.; *Vice-President*—Dr. H. J. Strong, J.P.; *Treasurer*—Mr. Sargeant; *Hon. Secretary*—G. R. White; *Hon. Assistant-Secretary*—E. F. Blow.

### The Liverpool Amateur Photographic Association.

A meeting was held at the club rooms, 3, Lord Street, on the 29th January. Mr. Paul Lange occupied the chair. The following were elected members of the Association: Norman Crook, A. C. Batty, Theodore Hubback, Miss Adams, F. W. Walker, E. S. Sole, and F. H. Elsby.

After a vote of thanks had been accorded to the retiring officers of the Association, the President distributed to the successful competitors the medals awarded in the prize competition of last November. The meeting was then made special to consider certain alterations in the rules of the Association, at the close of which Mr. F. Anyon gave an exhibition of a new lantern, with which he showed a series of fine slides, some of them of exceptionally high merit.

---

### The Bath Photographic Society.

A meeting was held at the Royal Literary and Scientific Institution on the 28th ult., Mr. W. Pumphrey (the president) in the chair. Miss Melita Bird and Mr. Cecil Bradshawe, Mr. Ernest Lambert, Mr. Graystone Bird, and Mr. C. W. Dykes were elected members of the Society.

The Chairman drew attention to the proposed visit of the Photographers' Convention to Bath next July, and a circular was read from the Camera Club inviting members to be present at their Conference, April 7th and 8th next.

Mr. J. Dugdale then showed the improved form of lanternscope he has recently devised for the purpose of viewing lantern slides. By its use the slide under examination is seen with both eyes at the same time, thus enabling the observer to form a more correct judgment as to the qualities of the work.

The Secretary showed a telescopic sliding metal tripod, sent by Mr. Pumphrey, of Birmingham. It could be extended to the usual height, or shortened to less than eighteen inches for microscopic work.

Mr. Pumphrey then continued his demonstrations of enlarging processes. In this instance a very simple apparatus was used—a dark chamber, in an aperture of which the negative to be enlarged was placed—in front of that an expanding camera minus the focussing and dark slide, and in front, and movable in three directions, an easel to carry the sensitive paper. A paraffin lamp, placed within the chamber, was used for focussing the enlarged image on the easel, after which it was removed to a tin lantern with a red glass front. A piece of oil ground glass was next placed before the negative to act as a diffuser, the sensitive paper adjusted on the easel, and the exposure made. This was done by means of magnesium ribbon; a string of ribbon six inches long and held by pliers was ignited at a spirit flame inside the chamber, and passed during combustion from side to side and up and down in front of the ground glass screen, this process being repeated as often as required. To produce a fully impressed enlarged positive on bromide paper, say from a dense half-plate negative, the enlargement being about three times, lens working at $f$-12, three such pieces of ribbon would be required. If a negative possesses great density in parts, the plan of illuminating offers distinct facilities for adapting the light to suit it. Mr. Pumphrey stated that this method was introduced by Mr. Monkhouse, York, and that it was by his special permission he brought it before the Society. The exposed paper was developed, and the result handed round.

An exhibition of lantern transparencies then took place; the president's oxyhydrogen lantern was used. First, there was a competition for the best set of slides, the work of the competing members, and also of the best individual slide. Messrs. Appleby Bristow, Hippisley, Peacock, Wells, and the Rev. E. A. Purvis competed. The judges were Messrs. Dugdale, Perren, Ashman, and Canon Williams, and the points of excellence sought for were four, namely, gradation, colour, composition, definition. Mr. H. G. P. Wells secured the highest number of votes for his series: "The Homestead, Milking Time," "The Glen, Summer and Winter," "Saltford Weirs," and "The Swans, Weymouth." Process: lantern plates, pyro development. For the best individual slide the award was given to Mr. Ernest Peacock, for a view of Uplyme. Process: lantern plate, pyro development. The competing slides were judged first by Mr. Dugdale's lanternscope, and then as they appeared on the screen. The remainder of the evening was devoted to an exhibition of non-competing slides, contributed by the chairman, Messrs. Bristow, Wells, Powell, Dugdale, Shackell, and others. Annual meeting February 25th, when, after the formal business, Mr. Wells will demonstrate the method of producing lantern transparencies.

---

### The Photographic Society of Philadelphia.

A stated meeting of the Society was held on Wednesday evening, January 14th, the president, Mr. John G. Bullock, in the chair.

The paper for the evening was read by Mr. Frederic E. Ives, being an abstract of his recent lecture delivered before the Franklin Institute on "Heliochromy, or Photography in the Colours of Nature." Four permanent colour-print heliochromes by his patented process were shown. He also repeated a suggestion which he made, incidentally, in his lecture at the Franklin Institute, and which was not published because the lecture was in print when the suggestion was made. After speaking of the insensitiveness of the old chloride of silver process, which is suitable only for printing-out under-coloured glasses and similar copy, he said he believed a far better printing-out process could be devised employing fugitive dyes, which, as is well known, are bleached by the light rays which they absorb. He said: "Suppose we take, for this purpose, three very fugitive dyes—a green-blue, a magenta, and a yellow. Every part of the spectrum can be represented by means of films more or less deeply stained with these dyes, separate or superimposed upon a white surface; and if the three fully coloured films are superimposed together, we get a good black. Project the solar spectrum upon this compound film, and what will it do? Sooner or later, depending upon the light sensitiveness of the dyes, the red rays will bleach the green-blue dye, which is the only one that absorbs those rays, and leave the yellow and magenta unaltered, making a full red. The yellow rays, which are absorbed by the magenta and the green blue dyes, will bleach them both, leaving only the yellow. The green rays, which are absorbed only by the magenta dye, will bleach it, and leave the yellow and green-blue dyes unaltered, making a full green. The blue rays, which are absorbed only by the yellow dye, will bleach it, leaving the green-blue and magenta dyes unaltered, making a full blue. Other parts of the spectrum, acting upon the same principle, will give intermediate tints by only partly bleaching the dyes by which they are not completely absorbed, and white light will bleach all the dyes, exposing the white support. It might be possible to mix the dyes so as to apply them together in a single film, as of collodion or gelatine. Should the light-sensitiveness of the dyes be unequal, evenness of action could be secured by the use of light-filters, as in orthochromatic photography. The process might be named 'heliochromography.' Turmeric exactly fulfils the requirements for a fugitive yellow dye, printing-out completely in a few minutes in bright sunlight. It will be only necessary to find equally fugitive dyes of the right shades of green-blue and magenta-red in order to obtain direct colour prints far brighter and truer than the best that have been made on the silver chloride plates. Cyanine, which prints out as quickly as turmeric, makes pictures that can be rendered permanent, but it is not exactly the right shade of blue to carry out the process with only three dyes. There are many coal-tar dyes so fugitive that they have no commercial value, and are not manufactured; among these it is quite likely that suitable dyes for carrying out the process may be found. Should it ever be found possible to continue, by chemical agency, the process started in the dyes by the light rays themselves, the picture could then be made in the camera, and if all the colours could be fixed, like cyanine, when sufficiently reduced, permanent photography in the natural colours would then be within the reach of every amateur. Meanwhile, we shall probably have to content ourselves with the more roundabout but no less scientific and capable method of composite heliochromy."

Mr. Browne said he would like to ask Mr. Ives one question. Some time about 1862 or '63 he remembered seeing a Daguerreotype plate sent from France, and which M. Becquerel claimed to have been made in the camera. It represented a Scotch plaid or shawl; the picture originally had very bright colours, but was then considerably faded. It was sent here as a very great curiosity, and was shown to some of the members of the Franklin Institute. Did Mr. Ives remember what process that was?

Mr. Ives said it was the same old chloride of silver process of which they had an illustration now on the President's table. It was considerably brighter than the pictures he had shown them, but it was substantially the same process, and was obtained by two days' exposure in the sunlight, using a portrait lens. A two days' exposure in the sunlight was, of course, entirely impracticable, no matter what the result might be. A method of fixing these pictures permanently had not yet been found; they had to be kept from light.

Mr. Earle showed and described a rubber-type outfit for printing titles and numbers on negatives. The novel feature was the fact that the types were positive instead of negative, as usual with type. As a consequence, they printed on the film of the negative in *negative letters*, and when so used a print from the negative showed the letters as *positive*, so that they could be read properly on the positive print. The types were easily set up, and could be read and corrected in the holder before any printing was done.

---

Received.—From Mr. Scholzig, some samples of gelatino-chloride paper, which we have tried and found to yield rich prints; the paper has a tendency to curl a little.——From Messrs. Iliffe and Son, "Photography in a Nutshell, by the 'Kernel.'" The compiler, in his preface, assumes in the reader an acquaintance with the rudiments of the art, and sets forth as his aim the addition, from personal experience and the produce of others, details of procedure which have been found useful. While acknowledging his indebtedness to articles in current photographic journals, the "Kernel" claims that the correctness of the views advanced by others has been tested by home practice.——From Bailliere, Tindal, and Co., the February number of "The International Journal of Microscopy and Natural Science." Among its articles is one by Dr. Charles Hacks, in *L'Illustration*, giving an account of an interview with Dr. Koch, in which the interviewer alludes to the extensive use made of photography by the celebrated doctor whose name is so intimately associated with the "cure of consumption."

---

D. W. E.—The matter about which you write is one for the police, and outside the functions of a newspaper unacquainted with either of the parties to the case.

S., Vienna.—Your article has been in type more than a fortnight. We are only waiting for space for its publication.

# Answers to Correspondents.

All Communications, except advertisements, intended for publications should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

H. L. (Highgate.)—*Foreground Shutters.* There are several forms of shutter which will give diminished exposure to the sky, and consequently, prolonged exposure to the foreground. Probably one of the best is Heath's patent foreground shutter with Cadett's pneumatic attachment, which is figured in Messrs. Marion and Co.'s catalogue. The "double flap" (Guerry's patent) shown in Mr. J. Fallowfield's catalogue, page 75, might also be suitable for your purpose.

R. M.—*Nominations.* Four out of the six names proposed for vice-presidents have also been nominated as members of council. Make your own selection, but it would not be proper to vote for the same individual in a double capacity. The progress medal is to be awarded to Lieut-Colonel J. Waterhouse, the intention having been officially announced both in the January *Journal*, and in a circular dated 31st ult.

J. H. (Sandwich).—*Collodion for Photo-litho Work.* 1. The recommendation to distil the methylated ether off quicklime was intended to keep back every trace of free acid, and it would likewise retain any admixture of water. If the alcohol also requires to be treated, you must do it separately; but in most cases you may rely upon *spiritus vini rect.* being sufficiently pure without such treatment. 2. Use iodide alone, that of cadmium preferred, without any free iodine, in the proportion of four to five grains per ounce of collodion, dissolving it previously in the alcohol. 3. Olein is the most liquid portion of olive oil, obtained by freezing the oil, and drawing off the uncongealed fraction.

W. S. (Bedford Square).—Either McKellan's or Watson's acme camera with rapid rectilinear and wide-angle lenses. The shutter you mention is reliable for work in a hot climate. We gladly note your approval of the Almanac.

L. T.—*Dr. Gunther's letter.* One can only guess that "water glass" or silicate of potash (or soda), may be the secret method of treating the lithographic stones, referred to on page 80 of last week's News.

C. L. B.—*Technical Examination in Photography.* The City and Guilds of London Institute holds an annual examination in May. It is not necessary that you should attend lectures at the Finsbury College, but you may get your knowledge anywhere, best by practical experience combined with reading for the theoretical points. Especially read up Professor Meldola's "Chemistry of Photography," and Captain Abney's "Instruction in Photography." Later on, ask the Secretaries for a prospectus of the forthcoming examinations.

One in Doubt.—*Framed Local Views.* Without actual inspection we cannot speak with confidence, but many of the glass pictures with narrow brass borders are simply silver prints mounted, with gelatine, in optical contact. They are not transparencies backed with white paper, as you seem to imagine. By uncovering at the back, and peeling off a little bit, you could, however, easily resolve your doubts.

A. W. (Bury St. Edmunds).—*Finishing in Black and White.* All depends upon aptitude and previous training; but we we should say less than six months ought to qualify you for undertaking this work. When prepared with specimens to show your capabilities and style, it would be easy to make a tour of your district and offer your services. It is quite impossible to answer your question as to average pay; high art should always be well remunerated, and we hope you will succeed in time. The little book on colouring and finishing is to be had of our publishers for thirteen stamps.

B. L.—*Albumenised Paper.* Ammonia increases the solubility or fluidity of albumen, but its use is not to be recommended.

Other Correspondents in our next.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1693.—*February* 13, 1891.

CONTENTS.



## NEW DISCOVERIES IN PHOTOGRAPHY IN NATURAL COLOURS.

In these pages to-day will be found an article from the Paris correspondent of the *Daily News*, telegraphed to that journal last Tuesday night, also a communication to us from M. Leon Vidal, about a new discovery made by Professor Lippmann, of the Sorbonne, in relation to the taking of photographs in natural colours. M. Lippmann has the idea that the phenomena of interference have some influence in the production of photographs in natural colours. The colours of thin plates, the colours of a thin surface of oil floating on water, and the colours of the soap-bubble as it grows thin, are phenomena of interference.

On perusal of the two articles just mentioned, it will be found that so little is stated about the process that nobody can work it until further details are received from Paris. A film of albumen containing iodide of silver is used, but how to prepare it is not stated, but the negative information is given that an emulsion is useless, the particles of the haloid then being too coarse. Whether the film must be as thin as a soap-film which yields colours is not stated.

The interference of light-waves is produced by means of metallic mercury at the back of the plate to send the rays back through the film; at least, the inference from a sentence in one of the articles is, that the mercury is in contact with the back of the plate, and not in contact with the sensitive film. The plates are developed and fixed "as usual." Does this mean that the ferrous-oxalate developer is used, or what?

As to the quality of the results obtained, the statements of the two correspondents differ extremely. M. Vidal describes them as poor, and the *Daily News* correspondent, who also has seen them, as excellent. The latter saw them last Tuesday, and M. Vidal saw some on the preceding Friday, so M. Lippmann may have made improvements meanwhile. The one describes some unfixed photographs in colours; perhaps those seen by M. Vidal were fixed, and had been nearly obliterated by that process.

At all events, a fresh advance in relation to photography in natural colours has been made, and we must wait for the details. Whether the first results be imperfect or otherwise is of small moment, for new discoveries are rarely of utilitarian value at the outset. If M. Lippmann wants a haloid film, free from granulation and rich in silver, perhaps a fluoride of silver film might answer, for that salt can be made in flexible films which can be cut with a pair of scissors.

## RETOUCHING—ITS USE AND ABUSE.

Since photographers have been compelled to pay more attention to the artistic qualities of their work, an outcome of the better art education of the public, it has become the fashion in many quarters to decry the use of the lead pencil, and to assert that every photographic portrait should be untouched, and that its native blemishes should not be glossed over. At many recent exhibitions many pictures of large heads have been shown in which this idea has been carried out, but it must be noted that these have generally been from picked subjects. We remember some most effective ones by Mr. Adcock, of Melton Mowbray, whose untimely death has only recently been reported, and one or two of these will serve as examples of portraits in which retouching may be entirely neglected with advantage. One is the portrait of a man, who appears to be a gipsy. His swarthy face is roughened with constant exposure to the winds of all seasons, and there are characteristic lines about his mouth and eyes which tell of cares which are almost inseparable from a roving, hand to mouth existence. His unkempt, curly black hair is covered with an old felt hat, which shades half the forehead, and a velveteen coat thrown open shows a ragged, white, collarless shirt. The picture is a striking one, and no touch upon the negative could possibly have given it improvement.

Another picture by the same hand represents a man who is more of a tramp than our gipsy friend. He has a rougher coat, and around his neck is one of those gaily-patterned scarves or comforters which are so dear to the hearts of our vagrants. He is lighting his pipe, and his rough, dirty hands are as full of character as his tanned face. His portrait, too, would be certainly the worse for being worked upon by the retouching pencil. In another picture, before us as we write, a far more wrinkled face belongs to a weather-beaten fisherman, for its surface is covered with ruts and furrows, which speak of constant exposure to cold winds and rain. These ruts give character to the honest face, and were we to attempt to soften them down, its picturesqueness would be gone. We may, indeed, say that in all cases where extreme age, or vicissitudes of life, have left deep markings on the face, retouching is inadmissible; but that in most other cases of portraiture it is not only legitimate, but necessary.

Those who are foremost in denouncing retouching as bad, and as merely ministering to the vanity of sitters, can hardly have had any practical experience in portraiture. Nor are they, apparently, aware of the undoubted fact that the camera notes certain markings on the human skin which are not visible to the eye. It is also guilty of exaggerating other marks which are visible, and of rendering such marks painfully prominent. In the first case we allude to slight discolourations, due to various causes, which no eye would readily detect, but should these be yellow or red in tone, they become most pronounced spots on the negative. Under the second head come freckles, which, light red in the original face, photograph as black as ink in the positive proof. It has been proved more than once that those sickening for an eruptive complaint will, if their photographs happen to be taken shortly before their illness, exhibit in their pictures the spots which, up to this time, are not apparent to the eye. We know of two such cases where the camera, to a certain extent, diagnosed in this manner the approach of disease. In each case the photographer attributed the spots to something wrong with his plates or chemicals, and did not guess that the patient was at fault until afterwards the illness was reported to him. Such extreme cases are, of course, few and far between, but it is an every-day occurrence that the smoothest face will show markings in the negative which are not apparent in the original countenance. It is most certainly legitimate to obliterate such markings by use of the lead pencil, and we may say the same of freckles, which are reproduced in such exaggerated fashion. It is certain that, if any photographer, in a fit of mistaken conscientiousness, were to send out proofs of his freckled client without touching up the negative, he would quickly find his occupation gone.

An instance of the abuse of the retouching pencil was recently placed before us as a specimen of what is done in a fashionable studio in Germany. The portrait was that of a lady who was well known to us, and—we hesitate to make the admission—we happened, by an accident, to be aware of her age. Time, who is most ungallant in his behaviour to the fair sex, had left certain markings upon her comely face, and the German photographer had, in his negative, pencilled them all out. Twenty years or more had by this base means been knocked off the lady's apparent age; and there was more than a suspicion that the artful pencil had at the same time removed a few inches from her waist. We were asked our opinion of the picture, and we gave it honestly: "A very good example of clever retouching." And so it was; but the face, in losing its slight wrinkles, and the expressive marks about the corners of the mouth, had been given a strong resemblance to a wax doll. It had a doll's prettiness, and a doll's utterly vacant stare—the intellect in had been pencilled out.

We have given extreme instances of the use and abuse of the lead pencil, but, of course, there is a golden mean which the wise retoucher will not o'erstep. In a word, the pencil should be used sparingly, and with judgment. Beyond the eradication of such foreign markings as we have indicated, it is hardly wanted at all, unless it be to gently strengthen the line of light along the nose and on the chin. The careful retoucher will never touch the eyes unless there is some accidental marking there which needs his help.

---

The Photographic Club.—Subject for February 18th, "Blisters"; on the 25th, the Monthly Lantern Meeting will be held.

London and Provincial Photographic Association.—The "Champion Hotel" 15, Aldersgate Street, E.C. February 19th, technical evening; March 3rd, lantern and musical entertainment.

Photography and Engraving.—Photography is naturally elbowing engraving out of the market, especially on the Continent. The *Architect* states that Belgian aquafortistes have been considering the present state of their art in response to an invitation from the Belgian Académie Royale. They offer the following suggestions about what is required:—(1) The creation of a printing office and a studio in connection with the Brussels Academy; (2) vigorous encouragement to the development of engravers' societies; (3) rewards for engravings after the works of the great painters of the country; (4) a gallery at the Musée of Brussels, which would be devoted to engravings in order to initiate the public in the knowledge of the art. In Antwerp there is an official printing office attached to the Academy, but it does not appear to be ever used. It would, adds our contemporary, be a pity for engraving to become one of the lost arts, but unless there is patronage from Government it is not easy to see how the highest class of work, which alone deserves encouragement, can be executed.

Geological Photography.—The past year has seen a new direction of enterprise in regard to the registration of geologic facts. The photographic art has been called into organised recognition. At the meeting of the British Association held at Newcastle-on-Tyne in September, 1889, a committee was formed to arrange for the collection, preservation, and systematic registration of photographs of geological interest in the United Kingdom. In some counties, as in our own, this impetus has taken a rather wider sweep, and aims at a general photographic survey of the county. As is known to many here present, an influential county council has been appointed for this purpose in Warwickshire, with Mr. J. B. Stone as president, and Mr. W. J. Harrison as secretary; and two members of this Society have been delegated to act thereon. Unquestionably many instructive geological sections have been lost to science through want of correct drawing, or photographing, at the time of their exposure; and it is hoped that this committee may aid in recording and retaining such facts. The result of the first year's work has been satisfactory; and the report to the Association at the Leeds meeting shows that 196 geological photographs have been sent in. It is to be hoped that in years to come this method of rendering permanent transient sections may be productive of good.—The Revd. G. Deane, D.Sc.

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

New Process of Photography in Colours—Utilisation of Photography for Impressions in Colours—Sensitised Silk—Radiguet's Electro Photophore—Sulphite of Soda in Development—Plates with Chloro-Bromide of Silver—New Pressure Frame—Micro-Photographic Slides—Direct Carbon Prints.

*New Process of Photography in Colours.*—The leading feature of the meeting of the French Photographic Society is a discovery by M. Lippmann. This scientist made a communication to the Academy of Sciences on the 2nd of February, which has since caused considerable commotion. "Photography in Colours," such is the subject of this discovery. M. Janssen, president of the French Photographic Society and colleague at the Institute of M. Lippmann, brought to the meeting of the Society one of the plates shown by M. Lippmann, and, with his habitual precision, gave explanations, as complete as possible, of the phenomena serving as bases for this discovery. Let us commence by saying that M. Lippmann, after many experiments, thinks that he has succeeded in photographing luminous undulations in such a manner that the reproduction permits us to see, by reflection, red where red has fallen on the plate, yellow where yellow has acted, and so on. He appears to have succeeded in registering the interferences resulting from the meeting of rays reflected from a reflecting metallic surface and of incident rays. From this meeting there results, in the case of light, as in that of sound, intermittences of light and darkness analogous to the alternations of sound and silence. These interferences being produced in the body, or, rather, in the thickness of a sensitive film, give rise to more or less numerous films after development, of which some are black, and others, corresponding to the obscurations, are white.

Now, according to the action of the rays of different colour, the number of waves varying with the colour, it happens that the eye perceives the colour answering to each number of waves that characterise it. It is known that the length of the luminous waves is measured by millionths of millimetres. Thus the spectrum red has a wave length of 620 millionths of a millimetre. Now, supposing that the sensitive film traversed by reflected and incident rays has a thickness of one-tenth of a millimetre, there will be called forth in this film of 100,000 millionths of a millimetre 161 waves in the one direction, and 161 waves in the other direction, from which there results a sort of interior strata of black and white films superposed, corresponding to the succession of light and shade produced by interferences. In the same case, the violet, having the wave length of 423 millionths of millimetres, produces strata of 235 black and white films, producing to the eye precisely the effect of violet light.

Experience seems to confirm this theory. M. Janssen showed a photograph of the spectrum confided to him by M. Lippmann. On examining it carefully, and making the little plate yield reflected images in different directions, we finally perceived a sort of iridescence in those parts where we were told the spectral colours existed. We only saw them very imperfectly rendered, and certainly we should never have suspected, if we had not been told of it, that it was a reproduction of the solar spectrum with the colours. Viewed as a transparency, the plate showed a reddish stain in the part corresponding to the middle of the spectrum. Theoretically, we ought to see, as a transparency, colours complementary to those seen by reflected light.

M. Lippmann operates as follows. In the first place, he covers the surface of a glass plate with a coating of albumen sensitised with iodide of silver. The plate is placed on the surface of a mercury bath arranged in a vertical camera, and the spectrum is projected upon it. The exposure lasts for from one to two hours, and the development and fixing are carried out in the usual manner. The essential precaution is to use a film as continuous as possible, as free as possible from network and granulations. Gelatino-bromide of silver emulsion is unsuitable on account of the very marked granulations of the bromide of silver. No emulsion will serve, and it is necessary to produce the substance chemically in the material serving as the colloid layer, so as to have the most continuous film possible—the least granulated that can be realised. This will be understood from what has been said above. And now what have we to conclude from this communication? I find myself absolutely embarrassed in endeavouring to form an opinion or hope in any direction. Is this a discovery conducting to photography in colours? Up to the present the principle involved is so delicate, and the results so incomplete, that I can really say nothing. I must await farther and more crucial experiments before I can bring myself to believe in the possibility of finding a satisfactory solution in this direction. We do not desire to be sceptical, but we ought nevertheless to be prudent, and not to trust too readily to hopes that may very likely never be realised. It is certain that a solution, to be in the least practical, must be supported by something very different from what has been shown to me. However this may be, the fact in itself is of very great interest; it adds to our knowledge of luminous action, and the spectral embryo obtained by M. Lippmann may very well develop itself and produce a complete image of the spectrum. This is for the future to decide.

*Utilisation of Photography for Impressions in Colours.*—Mr. A. Gravier presented a collection of phototypogravures printed in three colours, published by the *Petit Journal.* His object was to demonstrate the services rendered by photography, as, thanks to its aid, the original—a water-colour drawing—had been reproduced. The photograph of the picture had been made on three blocks of wood, on which the engraver had created the monochrome blocks suitable for rendering the three colours. It would, perhaps, have been better still to print from three negatives in which the selection of colours had been photographically made. The interpretation of the subject for the engraver would certainly in this way be more complete.

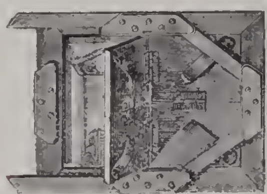
*Sensitised Silk.*—M. Tisseron has succeeded in preserving, without change, his sensitised silk. Samples and prints in support of this statement were produced. There is nothing remarkable in the process, but it is interesting to note the possibility of preserving the silk, ready for printing, for a long period without change.

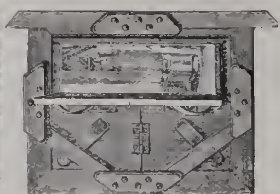
*Radiguet's Electrophotophore.*—M. Radiguet showed an electric lamp suitable for dark room illumination, called the electrophotophore. This apparatus consists of a bichromate battery of three cells, connected for tension. The globe containing the carbon filament of the incandescent lamp is itself enclosed in a box fitted in front with red glass. According as the zinc elements are plunged into the bichromate bath, or removed therefrom, the current is started or stopped. The duration of the light with one filling of the cells is only three hours, and the zincs are very rapidly dissolved. For ordinary work, then, this instrument will not be of much use, but there are cases where it will render certain service.

*Use of Sulphite of Soda in Development.*—The indiscriminate use of sulphite of soda has, with good reason, attracted the attention of M. Reel, who says that a developing solution containing ten per cent. of this salt may dissolve a film of bromide of silver. It is necessary, therefore, to limit the quantity to what the plate will bear without evil effect. It is true that reduced silver retards this action. M. Reel therefore advises the use of a developer sufficiently energetic to produce an immediate effect, so as to oppose the solvent action of the sulphite of soda.

*Chloro-bromide Plates.*—Messrs. Marion, Son, & Co. showed very fine results obtained upon their new chloro-bromide plates for transparent positives for lantern slides, &c. The plates are slower than those containing gelatino-bromide, but they are quicker than chloride plates, so that they may be used in the camera for enlargements and reductions, whilst yielding perfect transparency in the clear portions.

*New Pattern Pressure Frames.*—Messrs. Poulenc Frères exhibited pressure-frames of a new pattern. The illustrations will give a complete idea of them. The catches of the press may be opened in both directions,





and, consequently, allow the image to be seen in all its length and all its breadth, which cannot be done with the ordinary frame. This pattern will certainly replace the old type.

*Micrographic Lantern Slides.*—Amongst the many lantern projections exhibited, those by Messrs. Lumière and Son, of Lyons, were especially remarked. They represented the embryonic condition of the fowl from the first to the end of the third day. The photographic transparencies, printed in various colours by imbibition, are of remarkable delicacy and purity.

*Direct Carbon Printing.*—Mons. E. Vallot has made some happy experiments in producing direct impressions by carbon printing. The print is made in such a way that it is developed without transfer and without reversal of direction on the prepared paper itself. The process is analagous to that of M. Artigues—published in the Photographic News in 1889, p. 517. The latter not having disclosed his method, M. Vallot has been experimenting in the direction indicated, and his first results are very satisfactory. No doubt, with the manipulative skill that M. Vallot possesses, he will achieve remarkable success.

---

The Photographers' Benevolent Association.—At the meeting held on the 9th of February (Mr. Bedford chairman), Mr. Farrington was elected auditor; one grant was considered and refused; the report and balance sheet were adopted; and the annual general meeting was fixed for the 27th inst.

## PHOTOGRAPHY IN MANCHESTER.

### The Photographic Exhibition in Manchester.

The Manchester Amateur Photographic Society held an exhibition of the work of its members in the Athenæum at Manchester on Monday, Tuesday, and Wednesday this week, and in the evenings there were lantern displays, attended on each occasion by about 700 persons.

Among the photographs on view bromide prints were most numerous, perhaps aristotype ranked second in number, platinotype third, and ordinary silver prints fourth. Among the best exhibits are those of Mr. G. Wheeler, who has a screen to himself covered with views of Holland, and of scenes near Manchester; in the latter region he has detected, with an artistic eye, some pretty "bits" where nobody would expect to find them. Some views at Oberammergau by Mr. Lamond Howe, some of which he furnished to Mr. Stead, are interesting.

The Rev. H. J. Palmer had a great screen covered with enlargements, chiefly of Swiss views; he also exhibited photographs of French cathedrals. Mr. Palmer was formerly president of the Liverpool Amateur Photographic Association; he is now a vice-president of the Manchester Society. Miss Twist exhibited some excellent landscape photographs of small size, and by different processes. Mr. T. Glazebrook exhibited some good cloud subjects and fishing scenes; one of them represented a fisherman on the Wye, standing with his coracle on his back, and holding a fish in his hand; the title of the picture was, "What does it weigh?" Amongst Mr. H. Wade's exhibits was a sunset scene of an artistic nature; it was also exhibited on the screen on Tuesday night by means of the lantern, and warmly applauded by those present; he had taken the view with a hand-camera. Some autotype enlargements from quarter-plates by Mr. J. Davenport were of excellent quality.

Mr. J. W. Wade exhibited a platinotype print of "The Wounded Amazon," taken at the visit of the Photographic Convention last year to Eaton Hall; it had been printed by the cold process, and was of good quality; the same exhibitor placed on view a photograph of Chester Cathedral. Mr. G. A. Rigby exhibited some nice platinotypes, expecially Exeter Cathedral.

The following description of the Exhibition is from *The Manchester Guardian* of last Tuesday:—

The annual exhibition of work executed by members of the Amateur Photographic Society was opened to the public at the Athenæum last evening, and will remain open till Wednesday night. In photographic circles, an advertisement of a camera is well known in which occur the words, "You have only to press the button; we do the rest," the meaning of which is that the so-called photographer has only to hold or fix up his camera before a view or object, to "press the button," take out the plates when he returns home, send them to be developed to the place from whence they came, and in due time receive back a batch of negatives or spoiled plates as the case may be. If any of them be successful exposures, he may get a few beautifully printed and mounted specimens. Such button-pressers the Amateur Society, we are glad to say, does not acknowledge as photographers, and the work shown on its walls is not of this class, but is the genuine work of the person whose name it bears, except so far as the manufacture of the sensitive plates is concerned; nowadays, it may be said, no one makes these for himself. Enlargements are an exception to the general rule, and some of those shown are original only so far as the negative is concerned, the actual enlargement being made professionally; enlargement is, however, so much a mechanical matter that a picture may properly be spoken of as by the person who made the negative. The district round

Manchester has become a very much be-photographed one, and in many of the pictures shown we see, of necessity, the same places we have been accustomed to find at former exhibitions, and represented from very much the same positions. We may always know beforehand that Haddon will be to the fore, with Gawsworth a good second, and Miller's Dale, Alderley, and Marple not so far behind. This cannot be helped, but it is well that the midsummer holidays come to the rescue with a supply of less intimately known subjects.

Photographers are bimetallists, platinum and silver being their standards. The high price to which the former has advanced within the last few months may be one reason why fewer platinotypes are to be seen on the walls than usual. Another reason is the fact that an effect very much like that of platinum can be obtained by drying silver prints on a ground glass; indeed, so beautiful in detail and texture are many of the prints treated in this way that it is not to be wondered at that platinum is giving way, as also is bromide of silver, except for enlargements. Shiny surfaces, whether ordinary silver prints, or on Obernetter and other similar papers, continue to decrease in number, as it was foreseen some time since that they would do. That the ground glass plan worthily displaces bromide this exhibition abundantly proves; but if all operators could produce results in bromide equal to the screen of half-plate views shown here the case would be altered. It is difficult to see how better work could be done than this particular screen shows.

In an amateur exhibition of this kind it would be invidious to select special examples for commendation; as a whole the show is most excellent, and if we single out one or two special examples it is not because we feel that others are not equally to be admired. One exhibitor shows at the platform end of the room a very interesting set of 12 by 10 marine scenes, in which figures occupy a prominent place. This is certainly the most difficult branch of the art, and the exhibitor is to be congratulated on his success; some skies in the same series are also very excellent. A frame near the door fitted with the work of a lady is worth attention. Why ladies leave photography to men we could never quite make out. In many parts of the room will be found views that are the result of the "survey" undertaken by the Society, some of which show how necessary it is that such a scheme should be carried out. Among other buildings whose place shall know them no more is the Hyde Road prison, which is shown in six or eight capital views. Most of the enlargements are bromides, and some of them are as good as anything of the kind could well be—one of Fountains Abbey on the wall opposite the door, for example, and also some lake views at the head of the room. The few enlargements by the Autotype Company excel the others in richness; among them is a capital one by the President of the Society which, from a negative of $4\frac{1}{4}$ by $3\frac{1}{4}$, has stood enlargement up to 20 by 16. The only novelty in the room is shown in two bromide prints toned to a fine sepia brown by uranium; there is also a "cyanotype," or Prussian-blue print, as it is generally called, of Haddon, which is made into a moonlight scene by putting a moon up in the sky, and with not altogether an unpleasant effect.

The miscellaneous lantern slides by the members were shown last evening by Mr. J. Davenport, the president of the Society. The Rev. H. J. Palmer and Dr. Hamilton will exhibit a series this evening, and on Wednesday Messrs. J. W. Wade and J. Davenport will show a series under the title of "Holiday Rambles." These have been taken by members by means of hand-cameras; that is, by cameras held in the hand at the time of exposure. For the lantern exhibitions a fine "three-decker" lantern, well known to Manchester photographers, which has become the property of the Society, will be used.

The photographs on view were exclusively the work of the members, and all taken during the past year; it is a regulation of the Society that none of the pictures shall have been publicly exhibited before. All the photographs it is possible to accept are put upon the walls, that those who do inferior work may see how it looks alongside good work. This is found to produce a marvellous improvement in the general character of the exhibits the following year.

### The Lantern Displays at the Exhibition.

On Monday night local and other views, the work of the members, were exhibited in large number by means of a costly triple magic lantern, the property of the Society.

On Tuesday night, the Rev. H. J. Palmer, M.A., and Mr. A. Hamilton, M.D., exhibited a series of interesting views of the Rhone Valley district, and some of its lateral valleys. Mr. Palmer pictorially traversed the Simplon pass from Brieg to the Gorge of Gondo, and gave some excellent representations of the magnificent scenery. Next he gave the journey from Brieg up to Bell-Alp and the Aletsch glacier, but did not include the house there of Professor Tyndall. He next gave some leading features of the scenery from Visp and through Zermatt to the Gorner Grat; these included many excellent views of the Matterhorn. One series of the scenes had been taken in duplicate: a narrow-angle lens had been used in the one series, and a wide-angle lens in the other; those taken with the narrow-angle lens were much the better, as there was less dwarfing of distant mountains. Mr. Palmer was in the Rhone Valley in the hot season, when it is not pleasant. He described Visp as a malarious, unpleasant place, and told how, when panting for air one night, he opened the window of his bedroom, and in came a cloud of mosquitoes. He should first have extinguished the light. He stated how the people up the valley object to the railway, and said that he did not know why. The reason is, that the residents think that it will ruin Visp and places between Visp and Zermatt, for tourists will go straight to Zermatt, and require no horses, conveyances, or intermediate hotel accommodation. The "King of Zermatt," the chief hotel-keeper there, is also said not to like the new railway. The Swiss Government has overruled a variety of petty local interests, and the railway is now nearly finished.

Last Wednesday night, Mr. J. Davenport and Mr. J. W. Wade exhibited some lantern views illustrating holiday rambles and hand-camera work; among these were some by Mr. Wade of the pantomime of Cinderella, taken before and behind the scenes at the Comedy Theatre, Manchester. Those behind the scenes were taken by the aid of the flash-light; those taken in front were of scenes much illuminated by the lime and other lights, and with an exposure of half a minute; the lens had a stop with large aperture. The time seized for making the exposure was when one person was either singing or dancing, and all the others were still; Mr. Wade would then wave his handkerchief as a signal to the latter to keep quite still while he made the exposure; the one person dancing about the stage made no impression on the plate. Thus were theatrical views taken during public performances, without many of the observers present knowing that any photographing was going on; some of the views included a hundred figures. Mr. Wade is a vice-president of the Society.

### The Manchester Amateur Photographic Society.

The Manchester Amateur Photographic Society was founded five years ago, and, at the present time, has nearly four hundred members; twenty-three have been nominated for election at the next meeting. It is the largest photographic society in this country outside

London. Its president is Mr. J. Davenport, and its honorary secretary Mr. R. O. Gilmore, 1b, Cooper Street, Manchester. The Society has a new dark room, well fitted up, at 14, Ridgefield Street, Manchester; the carpenters who are making the lockers therein, the plumbers who are fitting up the sinks, and various other men employed, are all amateur photographers. The Society has a library of between 300 and 400 volumes, which will be stored in the developing room when the latter is finished. Some good enlarging apparatus is placed in this room for the use of the members, who appreciate it by making frequent use thereof. Development is performed in this room by means of variable daylight and a coloured screen. This a mistake; artificial light would be better. See the last Year-Book.

### The Manchester Camera Club.

This organisation was founded six years ago as a social club, limited to twenty-five members; since then the limit has been extended to fifty members. It has no managing body, and no officers but a treasurer and a secretary; the latter is Mr. J. Davenport, 6, John Dalton Street, Manchester, who holds office *pro tem.*; a new one will shortly be appointed. The meetings of the Club are held on the third Wednesday evening of each month at the Victoria Hotel, Manchester; a chairman for the evening is elected from among those present, and no proceedings are published. Most of the members are able photographers. They have "rambles" during the summer months, and each time there is a competition among the members. The taker of the best negative is presented by the Club with an autotype enlargement therefrom.

### The Manchester Photographic Society.

Last, but not least, of the three photographic organisations in Manchester, is the oldest of all of them, the Manchester Photographic Society, founded in 1850. In its earlier years it somewhat frequently shifted its abode, but is now settled in the Literary and Philosophical Institute, 36, George Street, Manchester, and has Mr. Alan Garnett for its president. Sir Henry Roscoe, M.P., was its president for three years; his time of office expired last year, and he is now one of the honorary members. The hon. sectretary is Mr. W. H. Farrow, of the City Surveyor's department, Town Hall, Manchester. Mr. W. I. Chadwick once held the office of hon. secretary to the Society for twelve or more years. At the present time the Manchester Photographic Society possesses about 140 members. It holds monthly meetings, also lantern meetings in the winter months. The library is well furnished with early and other works of historical and scientific interest on photography; the librarian is Mr. J. Schofield. The Society possesses apparatus of its own, and has an optical lantern in course of construction. In accordance with ancient custom, the meetings are preceded by a high tea among the members; this is found to soften asperities, and to get those present into a happy and sociable state of mind. The Society had an exhibition of the work of its members about a year ago.

---

*L'Amateur Photographe* appears this year with several improvements, including a new design on the cover. Its address is 24, Boulevard St. Germain, Paris.

Developers.—It must be clearly understood that, in our opinion, hydroquinone is somewhat inferior to ferrous oxalate as a developer for papers, and that to produce the best results on these the latter developer is necessary.—*Scraps.*

## THE DINNER OF THE PHOTOGRAPHIC SOCIETY.

Last Monday night the annual dinner of the Photographic Society took place at the Café Royal, London, Mr. James Glaisher, F.R.S., president, in the chair.

The President, at the close of the festivities, proposed "Success to the Photographic Society," coupled with the name of Captain Abney. He thought photography to be a blessing to mankind, for it had enabled even the poorest to obtain the likeness of members of their families as treasured memorials.

Capt. W. de W. Abney would rather do six hours' experimenting than six minutes' speaking. Papers at photographic societies should not be valued by their length, for the results of one which required experimenting for mouths, could sometimes be summarised on a sheet of foolscap. The interests of the Society had been much promoted by the work of its treasurer, Mr. Bird.

The President proposed "Prosperity and Success to other Photographic Societies," coupled with the name of Mr. Warnerke.

Mr. Leon Warnerke stated that, some years ago, their Photographic Society was the only one prospering in Europe; now, however, there are photographic societies in Berlin and elsewhere in flourishing condition. Next summer the Photographic Society will be represented at the International Photographic Congress in Brussels; he expected that there would be a large attendance, and that good work would be done.

The President next proposed "Success to Chinese Photography," coupled with the name of Mr. T. Chang. He should like to hear a few remarks from him in Chinese.

Mr. T. Chang, secretary to the Chinese Embassy, said:—"I thank you for the houour you have conferred upon me by so kindly proposing my health. I can truly say I am very pleased to be with you. This is the second time that I have had the pleasure of attending the annual dinner, and I hope to have this pleasure on many future occasions. As to our president's wishing me to say something in Chinese, I am rather nervous in speaking my own language amongst you, who cannot understand what I might say, so I prefer returning my thanks in English. I thank you again, Mr. Chairman, for your kindness."

Dr. Charters-White responded to the toast of "The Ladies," and Mr. W. H. Harrison to that of "The Photographic Press."

Captain Abney proposed "The President." He had known him for twenty years, and it had always been a great pleasure to serve with him on the Couucil of the Photographic Society; his heart was in the right place, and he hoped that he would long be their president, notwithstanding new rules. He had piloted the Society through many difficulties, and guided it into its present position.

The President, in his reply, said that he had always done his duty to the best of his ability.

The President next proposed the "Officers of the Society," coupled with the names of Captain Mantell and Mr. Bird.

Mr. W. S. Bird thought that the happiness of the present century had been much increased by the fact that photography had so much facilitated the easy obtaining of likenesses, which were disseminated by friends throughout all the world. Photography had done a great work in science; it had made new revelations in astronomy and microscopy, and it had progressed in its artistic features. Whatever a certain doctor might say, he thought that he never bore any malice, and that the photographic world would soon hear of the doctor again.

Mr. Sebastian Davis then took the chair, and proposed the health of Mr. William England, who had made all the arrangements connected with that social meeting.

Mr. William England spoke of his great interest in the success of the Photographic Society.

Various songs and recitations were then given; a song by Leistein, of Sweden, was much appreciated.

---

A Costly Gift.—During Sir H. D. Wolff's illness in Teheran, the Shah paid him every attention, and before he left he presented him with his photograph, handsomely framed with diamonds set in gold. The gift is of splendid workmanship, and is estimated to have cost not less than £2,000.

## NOTES FROM INDIA.

BY COLONEL J. WATERHOUSE, B.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

### Preservation of Eikonogen.

Professor W. K. Burton's paper on this subject, in the latest number of the *Journal of the Photographic Society of India*, is very interesting and valuable, especially as he seems to have found a satisfactory solution of a problem on which I have been working, more or less intermittently, for some time past. I have not yet tried the method he recommends for washing the eikonogen crystals, and then keeping them in a twelve per cent. solution of sodium sulphite, but, from my experience in the same direction, I have no doubt that it will answer well; the sulphite, however, must be good, and not alkaline. From recent notices in the European journals, it appears that the German manufacturers of eikonogen have succeeded in making a product that does not darken or decompose with heat and moisture, and it is said that this is brought about by the addition of a bisulphite. The new product is a white powder, and is most probably thoroughly desiccated, so as to drive off the water of crystallisation, to which may, in great part, be attributed the darkening of the eikonogen crystals. In dry air at a low temperature they keep well, but in moist air at a high temperature, as is the case here and in most tropical countries, they rapidly get into a moist, pasty state, darken, and decompose. Some eikonogen of English manufacture lately received is in salmon or pink granite coloured crystals, and, so far, it shows no sign of discolouring, but whether it will stand the quickly approaching hot weather remains to be seen.

Although Professor Burton has succeeded with the treatment with alcohol I suggested in a former number of the News, I find that it does not answer so well as I expected it would. Some crystals that had been cleaned with an acid solution of sodium sulphite, much in the same way as recommended by Professor Burton, remained white for a very long time in spirit of wine; but some fresh crystals put into absolute alcohol did not keep nearly so well, and the alcohol has extracted a good deal of a yellow substance. As Professor Burton remarks, in order to make the treatment by alcohol efficient, the spirit must be changed two or three times, as it draws out and becomes weakened by the water of crystallisation from the crystals. Precipitation of the eikonogen by acids has also been recommended as a means of keeping it in good order. I have tried several acids in a cursory way without quite satisfactory results. Phosphoric acid seemed to have a powerful action in keeping the solution free from darkening. Eikonogen is such a valuable developer, and so pleasant to work with, that so satisfactory and simple a means of keeping it in good order in tropical climates as that recommended by Professor Burton is very welcome.

It may be noted, with reference to the use of the dark-coloured washings of the eikonogen crystals as an ink, that, although it does make an admirable writing fluid, it is so easily washed off the paper that it is quite unsuitable to serve as an ink to be used for any permanent record.

### Thio-Carbamide Reversals.

Since the warm weather in September and October, I have not been able to make much progress in working out the direct positive process till lately. However, on taking it up in cooler weather, it was found that better results were more easily obtained, and some new experiments seem to have brought me almost within reach of a practical method, though much has yet to be done in working it out and perfecting it, so as to obtain perfect positive pictures with certainty.

The principal difficulty all through has been to secure clear lights with good detail in the shadows. If the high-lights are clear, the shadows are too deep; and if the shadows are clear and well detailed, the high-lights are liable to be over-done and unreversed. This is particularly the case in outdoor work with sky and trees, or dark foregrounds. It was evident that something was wanted which would more completely reconvert the reduced silver in the more exposed parts into silver haloid salt, so that it might be dissolved out by the fixing agent. This, I found, could partly be secured by prolonging the development, and allowing the reversing agent plenty of time to act and complete the reversal. The image thus produced may be too dense for printing purposes, but can be reduced, after fixing, with bromide or chloride of copper, so as to gradually bring down the lights and details till they are sufficiently clear, though the operation has to be conducted with some care to avoid uneven reduction. A preliminary treatment of the plate with dilute hydrobromic acid was tried, but was not found better than the dilute nitric acid, previously used with advantage.

In a leading article on the process which appeared in the *British Journal of Photography* for October 24th, attention was drawn to a curious compound of thio-carbamide and ammonium bromide, which was first described by Prof. J. Emerson Reynolds in a paper published in the *Journal of the Chemical Society of London* for 1888, and to which he gave the name tetrathiocarbamid-ammoniumbromide. This salt is quite easily prepared from thio-carbamide, and a trial of it has given me some very good results, better in many respects than those obtained with other thio-carbamides, and it acted in every way much better than the plain thio-carbamide.

Prof. Reynolds' instructions for preparing the new salt are to dissolve 1 part of ammonium bromide in as small a quantity of alcohol as possible, and add it to a nearly-saturated boiling solution in alcohol of 3·04 parts of pure thio-carbamide. The boiling is continued for some time afterwards, and then the flask is allowed to cool. On standing, the contents will be found to set into a mass at the bottom, and may be re-dissolved in alcohol for use. I find that about five drops of the strong alcoholic solution of this salt to the ounce of developer are sufficient, but in some cases more may be added during the development. It is important that the alcohol should be strong, because water decomposes the salt. In making up some of the salt, a little water found its way into the flask, and the product so obtained seems to work quite differently to the proper compound salt.

It is remarkable with what very short exposures strong, vigorous positives can be obtained by the addition of only a few drops of the solution of this salt to the eikonogen developer. In a case where the ordinary exposure with pyro development would have been from sixty to ninety seconds, ten seconds was found to be more than sufficient, and the exposure was actually reduced to two seconds. This enormous shortening of exposure points to what may eventually be one of the most valuable applications of this curious process, and that is to astronomical photography. Already, by the use of gelatine dry plates, the photographing of stars, nebulæ, and other heavenly bodies has been greatly facilitated, and made to render thoroughly practical service by the shortening of the long exposures necessary with even the most sensitive wet or dry collodion plates. By a still farther large reduction in the time of exposure, much more could no doubt be done. The long hours of patient attendance at the photo-telescope finder could be saved, and plates would be obtained which could at once be transferred to copper to be etched and printed. The new process may also prove useful in spectrum photography.

Prof. Reynolds has found that thio-sinamine and phenyl-thio-carbamide do not form similar compound salts with ammonium bromide; but I have tried some other bromo-compounds of these thio-carbamides, and find that a mixture of bromine and thio-sinamine promises well, and gives rich, vigorous images, with good, clear lights and well detailed shadows. I have prepared it by adding bromine water to a saturated solution of thio-sinamine, about equal parts. After a time the solution turns slightly opalescent and cloudy, probably from the precipitation of sulphur.

Dr. G. McGowan has found that excess of bromine causes thio-carbamide to lose its sulphur, and become converted into carbamide (*Journ. Chem. Soc. Lond.*, 1887).

I have lately been working with a form of developer which seems to act satisfactorily in the reversing process, and is simple: —

| | | | |
|---|---|---|---|
| Eikonogen ... ... | ... 5 grains | or 1 | gramme |
| Sodium sulphite ... | ... 5 ,, | 1 | ,, |
| Lithium carbonate ... | ... 5 ,, | 1 | ,, |
| Water ... ... | ... 1 ounce | 100 | c.c. |

The carbonate of lithia is kept in saturated solution at about one per cent., and the other salts are dissolved in it as required. A paper on lithia and borax developers has been long in hand, and should have appeared some time ago, but I hope to give it in an early number of the News.

As both thio-sinamine and thio-carbamide can quite easily be prepared, a few notes on their preparation, from experience, may be useful to anyone wishing to try the method, and unable to obtain them in commerce.

*To make Thoi-Sinamine.*—Procure some *essential oil* of mustard from the chemists; the *pure* mustard oil is best, but not easily procurable. The common oil contains resinous impurities which are very hard to separate out without re-distillation, which is a troublesome process, though they do not seem to interfere with the reversals. Care must be taken in handling this oil, because it gives off unpleasant, strong-smelling vapours, which are very irritating to the eyes. Having put some of the oil—say two drachms—into a stoppered bottle, add to it about four to six times its volume of the strongest solution of ammonia—one to one and a-half ounce—and leave it for some hours till the oil has been converted into crystals of thio-sinamine, or taken up as much of the ammonia as it will. The conversion may be hastened by shaking the bottle from time to time; but if the oil is impure, it seems better to allow the ammonia to act quietly, and not take up the impurities. The solution is then poured into an open vessel, in order to allow the ammonia to evaporate. This must be done out of doors, or in an open place, because the smell is very penetrating and unpleasant. The solution may, if necessary, then be filtered and evaporated down, and left to crystallise. Re-crystallisation once or twice will be necessary if the impure oil has been used, and the crystals can be kept or made into solution, as desired. The pure crystals are white and inodorous. Impure crystals may be yellowish and have a slight smell.

The preparation of thio-carbamide was first described by the discoverer, Prof. J. E. Reynolds, in the *Journal of the Chemical Society of London* for 1869. A quantity of sulphocyanide of ammonium is thoroughly dried till it becomes white and almost powdery. When fairly dry, it may be pounded up and the drying completed. It is then put into a flask, and heated in an oil bath *gradually* to about 170° C. (338° Fah.), and kept at that temperature for about two hours, the temperature being regulated by a thermometer introduced into the flask. The sulphocyanide melts and gives off vapours, and is gradually transformed into thio-carbamide (sulpho-urea). After sufficient melting, the flask is allowed to cool down to boiling point, and a little hot distilled water (80° C. or 176° F.) introduced; the hot solution is rapidly filtered and allowed to crystallise. The crystals always hold a large quantity of unconverted sulphocyanide, which may be removed by recrystallisation, and, to a great extent, by draining out, especially in damp weather, the thio-carbamide crystals being permanent, while the sulphocyanide is deliquescent. Pure thio-carbamide gives no red colour with a persalt of iron, but it is difficult to get rid of all traces of the sulphocyanide. The crystals take many different forms, partly depending on their purity and other conditions. Sometimes they are in very short, fine needles, at others in long needles, or in long, glistening, fibrous, radiating wisps like asbestos or spun glass, or again in prisms; the latter form seems to be the purest.

Besides the application to astronomical and spectrum photography already noticed, the new process, if it can be successfully worked in ordinary practice, might prove of use for portraiture in the studio, especially in dull weather, or, under other circumstances, when shortening of exposure might be of advantage.

It might also prove of use to itinerant photographers, who could thus be able to take transparent positive portraits which could easily be framed in the style of the sixpenny ferrotypes, and delivered, if not on the spot, at any rate in the course of an hour or two, allowing time for washing after fixing. Another application might be to the penny-in-the-slot apparatus, though here, again, time would be required for washing away the fixing agent. For reversed negatives and lantern slides, it may also be found useful, as well as for a great deal of amateur work in which a single positive transparency might really be more useful and better worth keeping than a negative. Its possible adaptation to the new diazotype process has already been suggested in the News, and from rough trials I have made would, I believe, answer well.

Wratten's "ordinary" plates still continue to give me the best results, and the fresher they are the better. There are, no doubt, however, other brands which might work with more certainty. The great difficulty is to get rid of the first developed negative image; and, if obtainable, something is required which will develop up the positive image at once. From some of the results lately obtained with Prof. Reynolds's compound salt, I believe that the process is capable of giving perfect transparencies with suitable plates; but in this country one works under very great disadvantages and limitations caused by want of leisure, unfavourable conditions of climate, and distance from European commercial centres, so I hope that the process may be tried elsewhere with various makes of plates, and the results reported.

## JEAN LOUIS ERNEST MEISSONIER.

BY THE REV. F. C. LAMBERT, M.A.

On the last day of last month the art world lost, in the death of M. Meissonier, a man whose name will always be regarded as an essential element in the art history of the present century. Meissonier was born, the son of humble parents, at Lyons, Feb. 21st, 1811. At the age of seventeen he came to Paris to study under Léon Cognite. Five years later, his first work, "The Visit to the Burgomaster," made its appearance at the Sâlon, followed the next year by his "Joueur d'Echecs," which at once established the painter as a master in *genre*. From that time a stream of works flowed from his hand, and medals, ribbons, and other honours and distinctions were showered upon him. Perhaps the most famous of his works are the Napoleonic series showing the great soldier at various stages of his wonderful career—*i.e.*, 1805, 1807, and 1814. It is said that the '14 was sold to M. Chauchard for 850,000 fr. It is interesting to know that Her Majesty, Queen Victoria, is in possession of one of M. Meissonier's finest works. By many competent authorities, "Le Rixe" is pronounced the master's *chef d'œuvre*.

In appearance, Meissonier was short of stature, somewhat stern in feature, hair and beard long and flowing. Among his hobbies were billiards and riding.

To a great extent it is true that, in his work, he *made*, rather than followed, a school. Waging a long war against the accepted methods of classicism, and crashing through the dogmas of the academies, he devoted his long life and undoubted talents to transferring nature to his canvas, relying on the keenest power of observation and an unrivalled technique. Those who deny the existence of any great poetry in his work assert that his abnormal—almost microscopic—eyesight enabled him to see what was to others quite invisible; and maintain that while he surpassed the Dutch in "niggling," he yet lacked their power of *chiaroscuro* and general manipulation. On the other hand, there are quite as many who heartily subscribe to the criticism of Eugène Delacroix, wherein it is asserted that Meissonier was the most incontestable master of our epoch.

Thus among painters, as among photographers, there are the pinhole, big-brush, palette-knife men, and also the *f* 64, fine-point, Meissonier-finish contingent; each anathematising the other. Who shall be bold enough to predict the "sole survivor of the crew" hereafter? Is it not better to seek the *via tuta, via media?* To attempt to treat all cases alike, to cure all complaints with medicine out of one and the same bottle, is to call up the unpleasant nursery reminiscence of the infallible brimstone—with or without the treacle.

Corot, Millet, Bastien Lepage, and others have come and gone during Meissonier's four-score years. Each in turn had discovered the only way—the philosopher's stone wherewith to touch his canvas—and now Meissonier's hand will no longer hold the brush. Of all men whose names are most likely to become welded into the history of art, none will be so closely linked to photography as that of the Lyons master, for the very simple reason that probably no other hand ever had that dexterity and cunning for reproducing on his canvas what most closely resembles that marvel of modern science, a well-focussed image on the ground glass. This man, who saw the birth and growth of photography, with all its possible wealth of detail-drawing, has been for years working in a more or less parallel line, and, although he has had a countless herd of followers, yet never a competitor.

One may safely prophesy that photographers will always include in their ranks a large number of workers who revel in the boundless ocean of detail attainable by optical means, and to them Meissonier will stand forward, not only as a justification, but also as a master for whom they have the most unfeigned admiration. Thus, his illustrious name will have for many photographers a degree of interest which, in all human probability, is likely to remain unique—at any rate, until the photographers' millennium—in other words, the discovery of photography in natural colours. However much men may disagree as to the rightness or wrongness of Meissonier's method of work, yet all must substantially agree that he was *facile princeps* in the method which he selected; and none have approached him in his power of truthful accuracy in portraying what is seeable.

P.S.—There is a melancholy interest attaching to a work of M. Meissonier now on view at Messrs. Tooth's Galleries, seeing that it is the last work from the master's easel. It is a water-colour drawing of small size, and entitled "Quiet Moments." The subject is a young gentleman in picturesque seventeenth century costume standing near a white marble pillar. He seems immersed in pleasant memories; the ungloved hands are idly, yet gracefully disposed. The background is a rich tinted, antique tapestry. The whole work is eminently characteristic of the master's wonderful powers, both in wealth of finish, and the rainbow purity and harmony of colour.

### The Barbizon School.

Messrs. McLean have now on view, at their Galleries in the Haymarket, a most interesting collection of pictures, few in number, but all fine examples. Among them is a small Meissonier, date 1864, and valued at not less than £2,000. The subject is an officer on horseback riding along an open road, the daylight declining—and the whole in a quiet and sombre key. The other pictures are, in themselves, a little epitome of the Barbizon school, and include several paintings by Diaz (No. 9 is a masterpiece), Corot, Jacque, Daubigny, and others of the open air workers. Probably No. 17, "The Hay Cart," is the finest and fullest work of Troyon's, and that picture alone is well worth a journey to the Gallery. The sheep in No. 25 (Jacque) are probably the woolliest and most sheep-like ever put upon canvas; this is also a masterpiece. There is a picture by L. B. Hurt, which most people immediately assign to Peter Graham, and not far from it is a small painting by that last-named artist, which is simply splendid in the way the clouds are treated. The collection also includes work by H. W. B. Davis, James Orrock, Vicat Cole, J. W. Waterhouse, and others.

---

The Vienna Photographic Exhibition.—It would seem from indications thus far, that the United States will be well represented at the forthcoming exhibition in Vienna. It is advised that prints be sent unframed, but mounted, and each print larger than $3\frac{1}{4}$ by $4\frac{1}{4}$ must be mounted separately. Exhibits may be sent to Mr. C. F. Eckhardt, 32, Aldermanbury, London, E.C., or to the Committee of the Vienna International Exhibition, at the Imperial and Royal Museum of Arts and Manufactures, Vienna. Applications for admission must be in Vienna by February 1st, addressed to Mr. Carl Srna, Club of Amateur Photographers of Vienna, Wallfischgasse 4, Vienna, Austria. The New York Camera Club expects to have a good representation, and it is to be hoped that other clubs will fall into line at once.—*Anthony's Bulletin.*

## Notes.

An ingenious individual made a calculation the other day which should be interesting to carbon workers, as indicating that they never need be in want of one of the first necessaries in their work. It must have been obvious to all during the recent arctic weather, when the snow was lying unmelted for weeks upon the ground, that the surface of that snow became blacker and blacker each day until it was difficult to imagiue that it had ever been white. The ingenious one referred to took the trouble to collect the black surface of this snow for a space of eight inches square, and, after drying the product, he weighed it, and found that he had obtained just two grains of carbon. This quantity certainly would not go far towards the production of a carbon enlargement. But our experimenter was also given to statistics, and knowing the extent of the metropolitan area, and assuming that the same quantity of smut fell upon each part of it impartially, he was able to arrive at the astounding conclusion that one thousand tons of soot had deposited itself upon that area in about ten days. Economists ought now to call upon carbon workers to lower their prices.

---

We now know, if we did not know it before, where our black London fogs come from, by which photographers lose much more than they would gain if the heavens rained chemicals of greater value than carbon. It is difficult to point to any cure for these disastrous occurrences, so long as the open fire is maintained as one of the Englishman's most cherished rights. Perhaps some day electricity will give us a better and cleaner method of obtaining heat for our houses. In the meantime, advances are being made in the construction of effective gas stoves, and the increasing adoption of these will, at any rate, mitigate the nuisance to a certain degree. It is melancholy, but to some extent amusing, to note that every year, so surely as the fogs come round, the same abortive remedies for dealing with them are trotted out. Smoke abatement forms at these times the subject of innumerable newspaper articles, stoves which consume their own smoke are invented, lauded to the skies, and as soon forgotten. Perhaps the spring-time makes us all so light-hearted that we forgot too soon the dark days of the metropolitan winter.

---

Eikonogen is a developer which has, since its comparatively recent introduction, met with many admirers, both among professional and amateur workers. It is undoubtedly valuable in bringing out detail in negatives which have received a short exposure, or which have been taken in dark places. For portraiture it gives a delicacy and colour to the negative which are appreciated by both priuters and retouchers, hence it is used exclusively in some of the first studios. Eikonogeu has recently made its appearance in a new form—that is to say, it is made up into "cartridges." These each hold enough of the developer proper, together with sodic sulphite, to meet the demands of half-a-dozen average sized plates. For tourist photographers and travellers—the terms are really interchangeable, for all travellers carry a camera now-a-days—these "cartridges will be found most convenient, for they only require admixture with a given quantity of water to be ready for use. Most tourists prefer to leave development of their plates until they are home again, and surrounded by the conveniences of their dark rooms; but most of them know the advantages of trying a plate or two *en route*, and eikonogen in its new dress will help them to do so without the encumbrance of bottles among their luggage.

---

A method devised by Messrs. Lumière, the well-known manufacturers of photographic plates, of obtaining micrographic projections which will throw up, by a different colouring from that of the background, the interesting parts of the pictnre without using hand-painting, is described in *La Nature*. A gelatine proof is first made in colouring material. The printing and development are conducted in the same manner as recommended for all carbon papers, but so managed that the proof shall be very faint, hardly visible. To obtain the colouring, the watery solutions of colours employed iu micrography—violet and blue, magenta and red—are used. The solution is poured on the picture, and the gelatine is penetrated in a few seconds, the background remaiuing lighter than the picture, which takes a vivid tint identical to that of the microscopical preparation if the tiuting has been carefully chosen. When the colouring is too intense, it must be abundantly washed in water, and the discolouring will slowly and effectually take place. Iu certain cases alcohol may be used.

---

It is also possible to obtain double colourings, as in microscopical preparations. In a microbe preparation, for instance, the microbe is frequently coloured in red, and the background blue. To secure this result, the gelatine print is first of all treated with an intense red tinting, but one which is not affected by the subsequent discolouration. A proof is thus obtained coloured entirely in red, the microbe being of a dark red, and the background of a light red. The discolouring is then gone on with until the background loses its tint. It may be treated then with the colouring which one wishes to give it, a faint solution being employed. The editor of *La Nature* says that a series of projections of microbes made by Messrs. Lumière, when projected on the screen, showed very well that the positives obtained by this method produce an effect superior to that of proofs in black obtained by the ordinary process.

---

Old-fashioned people will probably ridicule the notion that it is possible to know when the planet Mars is visited by a snow-storm. This attribute of winter is, however, the latest news from the planet in question. Prof. Pickering has lately taken fourteen photographs of Mars on two successive days. On the second day the photographs revealed the fact that the southern polar white spot was much larger than on the first day. In the first day's photographs the spot was dimly marked, as if veiled by fog or by particles too small to be represented separately; but on the second day the region was brilliantly white. The date of the event corresponded with the end of the southern winter of Mars, or with the middle of our February; and Prof. Pickering attributes the appearance itself to the effect of a snow-storm.

---

Great disappointment has been caused by the refusal of the New York Circuit Court to grant a motion for an injunction upon dealers in the pirated edition of the "Encyclopædia Britanuica." This piracy, it will be remembered, was committed with the assistance of photography. A firm in New York secured au early copy of the "Encyclopædia," and had the pages photographed, and was thus able to produce a *fac simile* at a much lower price than the original could be sold at. It certainly does seem a monstrous thing that English and American publishers cannot agree upon a common ground by which their interests will be mutually protected.

---

It is to be hoped, for the sake of cartoonists and the general public, that Lord Randolph Churchill will devote a few hours to sitting to an enterprising photographer. He has returned to his seat in the House wholly unrecognisable by his friends. The characteristic moustache, which was of such iufinite value to the caricaturist, has now the accompaniment of a beard, and the consequence is that, unless the public get familiar with his present appearance, the comic papers will be unable to use his lordship as a vehicle for their fun. Lord Randolph appears to be following the example of Mr. Parnell, who, some five or six years ago, was perpetually changing his appearance.

---

The Spectacle Makers' Company contemplates an exhibition of spectacles in the City. No doubt an exhibition of this kind would contain a great number of quaint specimens of ancient mauufacture, but the scope seems rather limited. At a dinner of the Company, held recently, a member suggested that the exhibition should be extended so as to include optical and scientific instruments. He contended, and with great reason, that an exhibition of spectacles only would not do, because it would simply be a display by foreign manufacturers and commission agents in the city. Of all the branches of the optician's art that of the manufacture of photographic lenses must now be considered to take the first place, both in variety and in novelty. It is rather strange, considering that just now photography is supposed to be the object of attention in city circles, no mentiou of this fact should have been made at the dinner in question. We are afraid that the Spectacle Makers' Company, like nearly all the other companies, is chiefly composed of persons who know less about the handicraft of their own Company than most people. We do not kuow that auy decision has been come to respecting the forthcoming exhibition, and we would suggest, if it should go outside spectacles, that a splendid opportunity would be afforded for showing the world what has been done in the way of improvements in photographic lenses.

---

Our police, probably, have neither the education nor the taste for science which would render the system of identification of criminals by means of measurement successful. The matter has engaged the attention of the Home Secretary, who, in reply to a question put to him this week, said there were various objections to the introduction into this country of the system. What these objections were he did not state, but we fancy that they would originate with the police authorities. At the preseut moment the Commissioner of Police thinks that, under the present system of photographing prisoners, there is, altogether, a greater percentage of identifications than the French system affords. This may be so, but the question is whether the two systems cannot be tried together. If the present method of photographing the prisoners is really superior to the measurement system, the latter must be very defective, as the photographs usually taken in goals are not the very best specimens either of scientific or artistic work. But, of course, there are exceptions, such as those taken by Mr. Payne in Aylesbury Gaol.

---

The extraordinary rise in the price of platinum has caused iuconvenience in quarters other than where platinotype paper is manufactured. An optician is now waiting trial at the Central Criminal Court for having feloniously received about ninety-nine ounces of platinum, valued at £350. The prisoner called on Messrs. Johnson and Mathey, who probably are the largest consumers of platinum in the world, and asked them if they would buy a quantity of platinum he had for sale. Messrs. Johnson and Mathey had a sample analysed, and found in it traces of phosphoric acid. This was sufficient to tell these experienced chemists the origin of the platinum. It had, in fact, been in the form of "dishes" used in the manufacture of chemicals of which phosphoric acid forms a part. It was subsequently discovered that Messrs. Johnson and Mathey were right in their conjectures, for the platinum had been stolen from the premises of Messrs. Dunn and Co., chemical manufacturers, of West Ham. Had not the demand for this metal increased so enormously during the past two years, it probably would not have been worth anyone's while to run the risk which the prisoner in question has incurred.

---

Judging from a story in the *Chicago Mail*, it appears to be the fashion in the United States for young ladies to have their letters photographed, so that, in case of the originals being destroyed, or the ink fading, they have tangible evidence to go upon should the swain prove faithless. This shows an amount of shrewdness and caution to which, at present, our English damsels have not yet attained.

## HOW TO MANAGE THE LITTLE ONES.

BY J. M. BRAINERD.

In the treatment of children under the skylight, it must be remembered that they have very sensitive feelings, which are shocked by the immodest staring-at often given them by strangers, who thoughtlessly overwhelm them with familiarity. They cannot be introduced by formal phrase, and put at ease like a society belle. Who has not observed the pain depicted on the face of a retiring child caused by people who, desiring to show their love, shower on it well-meaning but tactless attention?

Preparations for photographing children should begin with a cordial reception of the mother, which assures her of your confidence in your ability successfully to take babies in general, and your pleasure in photographing her darling child in particular.

Sometimes several friends and relatives come along to help. As I am looking after future business, if they desire, they are allowed to enter the operating room, and gratify their curiosity while the accessories are being brought into position.

The mother is asked to be seated near where the child is to be posed. After a general focus has been made on the accessories, and I am about ready to turn my attention to the child, the rest of the party, except the mother, are politely requested to retire to the reception room. This part should never be omitted.

The next necessity is to instruct the mother in what is expected of her, assure her that she need have no anxiety about the child keeping still, that she is not to ask it to sit still, or to entertain it, but that you will do it as well as the posing, that she is to remain solely for company, that the quieter she keeps the easier it will be to get a good picture. Half the difficulties can be avoided by a few words of explanation. The mother, in her anxiety for the child to sit well and cause no trouble, will only increase it if allowed to help; but if she realises the principle involved, that the child's mind must be given up to the control of the mind of the photographer, she will usually keep quiet, though I have met some that could not.

I carefully avoid allowing the child, if bashful, seeing me looking at it, or think I am making any effort to entertain or get acquainted with it.

Close by the skylight is a cupboard well filled with toy cats, birds, dogs, dolls, bells, gay ribbon belled sticks, horses in hoops that can be rolled about the floor, also cloth elephants, monkeys, and jumping-jacks, besides what is called a "trick-with-a-hole-in-it." This is simply a 14 by 17 cardboard, six inch circular opening cut out of the centre; it is for "Peek-a-Boo" at short range. This always hangs outside the cupboard, and is the little joker that takes the most unpromising child with its most angelic expression.

I do not use all the toys at once. Girls are always interested in dolls; small ones can frequently be used in the picture to good advantage, as they hold them with a naturalness and grace born with their motherly instincts.

Boys like horses, dogs, and monkeys. It is unsafe to promise boys you will show them something unless you have the goods to fulfil. One day, after trying to take a three-year-old, and telling him about the monkey I was going to show him, but deferring it so long that he doubted me, he said, "You havn't got any monkey but yourself."

An excellent thing to put a group of children in a good humour is the jumping dog that is worked by a bulb and rubber tube.

These toys are only the embellishments that serve to illustrate the old stories about the bird or the three little kittens, as it is through the child's imagination and curiosity that we enchain the restless hands and lips.

Sometimes children are so much interested that they look with wide-open mouths, or, owing to the difficulty in breathing through the nose from colds, it will not keep together naturally. A pinch of pulverised sugar put in the mouth from a bowl always kept in the cupboard will close them satisfactorily every time; the taste will cause them to keep it shut long enough to get a shot.

With children from two to five years old, I often pretend to fix up a playhouse for them while getting the accessories in position; they are surprisingly ready to take any part in the play—from resting in the chair to sitting on top of the house while the circus goes by.

For cabinet size, I always have half a dozen 5 by 7 plate-holders fitted to my 8 by 10 camera within reach; for the plate must be ready to expose the moment the child is "mesmerized," as an assistant declared he thought I did with children. There is, at any rate, a golden moment that must not be lost by any hitch in rapid execution of the work.

If, for any reason, children become weary of the operation before a satisfactory sitting is obtained, they are at once taken down from the seat, and, if necessary, taken out of the room to amuse themselves. It is labour lost to spend time on them after you cannot hold their interest. They will soon be ready to come back with renewed interest. The first three minutes after an irrepressible has been seated is the easiest time to take him.

An average child can be photographed as well in five minutes' time under the skylight as an adult in fifteen. While it is easy to make a still negative of a child, a study of the show-cases in front of many galleries will indicate that little taste and thought have been expended on the subject, and the photographer has been satisfied to get simply a sharp negative. Other exhibits will prove that it is possible to make child-photographs that please the artistic eye of the patron, and bring reputation and financial success to the photographer.—*Wilson's Photographic Magazine.*

---

Celluloid for Printing Plates.—Among the objects exhibited during the last meeting of the "Fachtechnische Club," der k. k. Hof- und Staats-druckerei in Wien, Austria, there were some celluloid plates proffered by Mr. August Denk, proprietor of the Embossing establishment at Vienna. These plates contained transfers from copper engravings. These celluloid plates, which have a milk-white appearance, are somewhat transparent and flexible, and are so hard that they may be printed from the same as from a copper plate. The proofs exhibited demonstrate that the impressions are as clean and perfect as those made from the original plate. Celluloid may therefore be employed to good advantage in copper engraving establishments. If, on account of celluloid being so very ignitable, one should hesitate to use such plates, they may be employed with great advantage for reproducing original plates by making celluloid negatives instead of using silver, and making by means of these celluloid negatives printing plates, employing the electrotype process. Celluloid printing plates which were exhibited, and which had been rubbed in with ink, were really pieces of art, which could easily be used as window transparencies or tops for toilet and other fancy boxes.—*The Lithographic Art Journal.*

## THE OPTICAL LANTERN: ITS HISTORY AND DEVELOPMENT.*

BY WM. LANG, JUNR., F.C.S.

In compressing into a short paper a few facts regarding the optical lantern, I would wish at the outset to state that I do not presume to be able to deal at all exhaustively with my subject in the few minutes at my disposal, which might probably be extended to as many hours. I have simply collated a few facts, historical and otherwise, which, perhaps, to some of you may be sufficiently novel, and which I hope may interest.

I think we may take it that the lantern has long since ceased to be regarded as a plaything, and it almost seems unnecessary to state to a photographic gathering, such as we have here to-night, that the main factor in bringing about this result has been photography.

As a society we did well when we resolved to have a lantern of our own, ready to be used at a moment's notice, either to show a pleasing picture or to assist in illustrating papers which members may, from time to time, bring before us. As a means of education, the lantern is coming to the front; lecturers and teachers are now making use of the lantern, dispensing with cumbrous diagrams, and by means of a well-defined picture riveting the attention of the audience in a manner that was quite unattainable by previous methods.

The name which has been universally associated with the lantern's early beginnings is that of the Jesuit priest, Athanasius Kircher, a man of no mean scientific attainments, who flourished in the seventeenth century. The work which contains the earliest known representation of the lantern is Kircher's *Ars Magna lucis et Umbræ* ("The Great Art of Light and Shade"), published in Rome in 1646. An edition was also published in Amsterdam, but considerably later, in 1671.

Kircher was born in the sixteenth century, in 1598. He was a native of Hungary, and taught in Wurtzbourg. In addition to the work already mentioned, he was the author of at least a dozen treatises, embracing all sorts of subjects—optics, magnetic phenomena, Egyptian obelisks, Tower of Babel, &c. I have never yet been able to procure a copy of his *Ars Magna lucis et Umbræ*, but I have brought as a curiosity a folio volume, published in Amsterdam in 1669, of Kircher's entitled *Ars Magna Sciendi* ("The Great Art of Knowledge or Learning"). There are some quaint engravings throughout the book, and, although somewhat worm-eaten, the volume is not without interest. Kircher founded in Rome a museum of apparatus and antiquities.

To return to the more immediate subject we are considering. There are figured in the work, "The Great Art of Light and Shade," two forms of the early lantern; but it has to be noted that these pictures do not occur in the early edition of 1646, but only in the latter one of 1671. We will have one of these forms projected on the screen. It represents a square box of wood, with a sort of shaft in the upper portion to carry off the smoke of the lamp; the said lamp carries a reflector of a kind. Opposite the light is the projecting lens, and outside is shown the painted glass slide. To judge from the picture which is to be found on the wall of the apartment, the subjects chosen were certainly not the loveliest nor the most agreeable. The gentleman with outstretched arms is supposed to be an unfortunate individual surrounded with eternal flames, so that, you see, the early lantern was an instrument of education of a kind.

The other picture now shown shows a slightly different arrangement, inasmuch as the lantern itself is concealed, as it were, in a separate compartment. This was, of course, to heighten the effect. The oil lamp hangs suspended from the roof of the lantern by means of a chain, and the picture shown on the wall represents Father Time as a skeleton with scythe and hour-glass.

In a quaint work, "Recreations Mathematical and Physical," published in London in 1708, we find an engraving of a lantern very much the same as the foregoing. This work was a translation of a French one by Professor Ozanam, a professor of mathematics in Paris. I may be allowed to quote what the author there says regarding the lantern, and we will show, at the same time, the picture of the lantern in the book:—

"This is called magical with respect to the formidable apparitions that, by vertue of light, it shows upon the white wall of a dark room. The body of it is generally of white iron and of the figure of a square tower, within which, towards the back part, is a concave looking-glass of metal, which may either be spherical or parabolical, and which, by a groove made in the bottom of the Lanthern, may be either advanced nearer, or put further back, from the Lamp, in which is oil of olives or spirit of wine, and of which the match ought to be a little thick, that when 'tis lighted it may cast a good light, that may easily reflect from the glass to the fore part of the Lanthern, where there is an aperture with a prospective in it composed of two glasses that make the rays converge and magnifie the objects.

"When you mean to make use of this machine, light the lamp, the light of which will be much augmented by the Looking-glass at a reasonable distance; between the forepart of the Lanthern and the prospective glass you have a trough made on purpose, in which you're to run a long, thin frame with several little different figures painted with transparent colours upon glass or talc; then all these little figures, passing successively before the prospective thro' which passes the light of the lamp, will be painted and represented with the same colours upon the white wall of a dark room in gigantick monstrous Figure, which the fearful, ignorant people take to be the effect of magick."

The concluding sentence explains how the term "magical" or "magic" came to be applied. Ozanam's book is replete with curious formulæ and problems, and the copy which I possess can be examined afterwards by those interested.

Connected with these early facts, I came across quite recently a reference to the original prototype of our lantern which I do not think has been elsewhere recorded. A French traveller of the seventeenth century, De Moncorrys, describes in a volume devoted to what he had seen in England a dark lantern, which, having a demi-globe (that is, I presume, a bull's-eye), could project objects, or representations of objects, painted on glass and inserted between the light and the lens. This he saw in the establishment of a Mr. Rives, a microscope maker of Long Acre. This was in the spring of the year 1663, eight years previous to the edition of Kircher's work already referred to, which had the illustrations. It would be instructive to compare Kircher's two editions to see whether the lantern is actually described in the first edition, viz., that of 1646, seeing no illustrations of it have been furnished. I may mention that in Professor Ozanam's work, from which I have already quoted, Friar Bacon is credited with being the originator of the lantern.

De Moncorry's volume is lying on the table, and can be inspected afterwards. The spelling of Longueker rather puzzled me at first. Before dismissing De Moncorrys

* A communication to the Glasgow Photographic Association.

and his travels, it may be interesting to mention the fact that in the accounts he gives us of his journeyings in Italy—and he appears to have visited it on three separate occasions—he was several times in the company of Father Kircher. De Moncorrys may be described as a scientific Pepys.

From the end of the seventeenth to the beginning of the nineteenth century the magic lantern seems to have had an existence which can best be described as dormant. On the authority of Sir David Brewster, in his "Letters on Natural Magic," we find that an attempt was made by one Philipstal, in 1802, to awaken interest in the instrument by the exhibition of effects which were known under the name of phantasmagoria. In these, by means of a transparent screen interposed between the spectators and the lantern, and the latter being made to approach to or recede from the screen, the objects represented—generally of the most gruesome nature—were made to grow larger and larger, or, on the other hand, to diminish gradually. The figures painted on the glass had necessarily all the surrounding parts rendered opaque, so as to heighten the illusion. It is instructive to read what Brewster wrote in 1832: "Superior as the representations of the phantasmagoria are to those of the magic lantern, they are still liable to the defect which we have mentioned, viz., the necessary imperfection of the minute transparent figures when magnified. Even Michael Angelo would have failed in executing a figure an inch long with transparent varnishes when all its imperfections were to be magnified."

Now, what the hand of man could not do photography has been able to accomplish. In the photographic transparency we have not only the perfect picture, which can bear amplification to almost any extent, but complete fidelity to the original, be it a scene in nature or the reproduction of a work of art.

The imperfect oil lamp of the lantern's early days has been replaced by improved methods of illumination. We may for a moment just refer to these, and we will consider first the limelight. When a mixture of oxygen and hydrogen gases are burned together from a jet, a temperature is produced so intense that thick platinum wire is readily melted, and iron and steel burn with vivid scintillations. The oxyhydrogen flame is but feebly luminous in itself, but when it is directed on to a ball of lime, which does not itself fuse, a light of the greatest intensity is obtained. Formerly, it was known as the Drummond light, in consequence of a Lieut. Drummond proposing to utilise it in connection with the trigonometrical survey of Great Britain. As an instance of what the light could do, it is recorded that, on the 31st December, 1845, it was seen across the Irish Channel from the top of Slicoe Donard, in Ireland, by an observer stationed on the top of Mount Snowdon, a stretch of one hundred and eight miles. This was in daylight. In actual practice, as you are aware, the hydrogen gas is now replaced by coal gas, that is, of course, in towns where gas is universally used. Gas, being a hydro-carbon, is, however, not pure hydrogen, but a combination of H. and C. The so-called hydrogen supplied in tubes is, for the most part, a volatile hydrocarbon made from oil by what is known as Pintzch's process. The electric light has, on several occasions, been utilised for lantern work, but, as it is not so readily available, we need do no more than refer to it.

In the sciopticon, an American form of the lantern, the vegetable oils formerly made use of have been replaced by paraffin oil. On the authority of the *British Journal of Photography*, I find that this modification of the lantern was first introduced into our country by Mr. W. B. Woodbury in 1873, and the name associated therewith in the country of its birth is that of Marcy. It was originally a lamp of two wicks, but it is now universally made with three. The form of the sciopticon is well known to all, and the picture on the screen presents it to you.

In the optical arrangements connected with the lantern of the present day there are two essential components, viz., the condenser or condensers, and the objective. Taking the first-mentioned, its object is clearly to cause the light of the flame to pass through every part of the transparency. The diagram thrown on the screen shows very clearly what happens when a light from any source falls upon a glass picture where no lens is interposed. It will be seen that only the rays passing through the centre of the transparency can ultimately reach the screen. Let, however, a lens be interposed, as in the diagram now shown, and you will see how the rays are gathered together, and the picture in consequence duly illuminated. In actual practice, the condenser is not of the simple form shown in these diagrams. We will pass through the lantern one or two of the leading forms adopted. Perhaps the condenser most in vogue is that where two plano-convex lenses are mounted close together where the light is received upon the flat surface of the condenser nearest the light source. The light is projected to where the object glass must be placed. What is known as the Herschel condenser, as shown in diagram, consists of either a plano-convex, or meniscus, and a double convex. The plano-convex is made of flint, and the other of crown glass. Dallmeyer's form consists of a plain convex in front, and is made of flint, while the second lens has its two sides curved unequally in order to bring the rays of light to a point in front, which it is impossible to do by the other form. This form of lens is what is known as crossed, and is made in the present combination of crown glass.

In order still further to increase the illuminating power, triple condensers have been devised, where a smaller lens has been interposed between the radiant and the condenser. Mr. J. Traill Taylor is credited with the suggestion. The diagram shown will show how the increased illumination is brought about.

It has to be noted that defects in the condenser are of much more account than similar defects in the objective; hence every care should be taken to avoid scratches, for these become magnified on the screen, and a perfect disc will never be obtained.

As we have a large collection of slides to put through our lantern to-night, in addition to those sent down by Mr. Pringle illustrative of his paper, I think it will be well for me to break off at this point, leaving the consideration of the objective of the lantern for another occasion, as also several other matters which would require a very considerable time indeed in order to go into them properly. With your permission, therefore, I will simply stop short in my remarks, and in doing so, I will come under the obligation to resume the subject of the optical lantern, it being, of course, understood that you should wish it at another meeting. I would like myself personally to bring out in a manner, which I have been perfectly unable to do in the short time at my disposal, how very completely the optical lantern can be made to illustrate facts bearing on the laws which govern and regulate that marvellous manifestation of energy which we recognise under the name of light.

## PROFESSOR LIPPMANN'S DISCOVERY IN HELIOCHROMY.

The following is from the Paris Correspondent of the *Daily News*, telegraphed last Tuesday night by him to that journal, and published in its issue of last Wednesday:—

Photographing in Colours.

The scientific world has been startled by the announcement made by M. Lippmann (Professor of Physics at the Sorbonne), at the last sitting of the Academy of Sciences, of a new process of photography discovered by him, by which colours throughout the whole range of the spectrum can be reproduced on a sensitive plate, just as accurately (since colours are but numbers of light waves) as outline or shadow are fixed by the present photographic negatives and prints. M. Lippmann's first attempts to take coloured photographs have not gone beyond the experimental stage, and a long time must elapse before this branch of photography is brought to the perfection which its sister branch has attained. After a few weeks' attempts, M. Lippmann has succeeded in photographing a stained window in colours as brilliant as the original ones. His researches, however, quite apart from the magnificent possibilities which they bring within our view, claim the regard of every scientist as an illustration of the power of the inductive method.

M. Lippmann, whom I met yesterday at his laboratory at the Sorbonne, very obligingly showed me his coloured plates, and gave me an account of his discovery, drawing on a sheet of paper, as he proceeded, a number of interesting diagrams, which unfortunately cannot be sent by telegraph. The plates were all photographs of the solar spectrum. All the colours of the rainbow were there, including the infra-red and the ultra-violet, invisible to our eyes. The plates, however, had registered them and kept an impression of them, showing themselves in this respect superior to the human eye. These two mysterious colours were represented in their proper places by two distinct stripes, apparently of a jet-black colour. I say apparently, because it was only our imperfect vision which made them seem so to us, their real colours, of course, being infra-red and ultra-violet. The other colours between these two—red, orange, green, blue, &c.—were as vivid as any objects in nature.

As I was examining these plates, an assistant came to say that a coloured photograph, the first of a stained window, had just been taken out of the developing bath, and was in splendid condition. The stained window, as I saw on proceeding to the dark room, was a most primitive affair, four pieces of coloured glass—green, yellow, red, and blue—soldered together. "This is all we could put together," explained M. Lippmann, "but it is quite sufficient for my purpose." The plate, which was not yet fixed, was taken out of its box for a few seconds only, as this plate was precious, and we were afraid of injuring it by exposure even to candle light. To our great delight the colours were there, and rendered with photographic faithfulness. A second plate was undergoing exposure, the image of the stained glass design being thrown upon it by means of a sort of magic lantern lighted by electricity. The plate was pressed against the opening of a trough filled with mercury, which formed a mirror in contact with the plate. The rays of light pass through the sensitive film as in the old process, but on reaching the other side of the plate, instead of being absorbed by a dark background, they are sent back by the even surface of the mercury. In this mirror the whole secret lies, for apart from it the entire process is exactly the same as in ordinary photography.

Before explaining why a mirror placed on the back of a sensitive plate during exposure causes the silver precipitate to assume all the colours thrown upon it by the camera, the reader must be assumed to have a slight acquaintance with photography, and also with the laws ot light, which offer a striking parallel to the laws of sound. Light, like sound, is but a form of motion. Both appear to propagate themselves by a wave-like motion, similar to the ripples on a pond when a stone is thrown in. The only difference is that, owing to friction, the waves of a pond tend to lengthen out and to disappear, whilst the waves of light or sound preserve their original length throughout their whole course. For light the wave-length—or, rather, half-wave length—is small beyond conception. It is for red light 0·0002 millimetres; for yellow light, 0·00025 millimetres; for green light, 0·0003 millimetres. In other words, there are 5,000 waves of yellow light to an inch, &c. A curious property of sound or light waves is that, when they meet another wave of equal length coming in an opposite direction, the conflicting waves overlap each other, the continuity is broken, and a succession of dark and light, or silent and loud, intervals is produced. A French physician of the beginning of this century, Napoleon Savart, was the discoverer of the phenomenon called interference of sound. If the ear is placed at a short distance off a sounding or echoing plate, and gradually drawn away, it will be observed that the sound alternately dies away and comes back with two-fold intensity. The explanation of this is that the waves of sound, the direct and reflex waves, alternately neutralise and reinforce each other. The two conflicting waves of sound or of light might be represented by the two serpents of Mercury's rod, which form a dot at their intersection, and a wide space between each dot. Each is a wavy but continuous line, whilst the two combined give a sort of broken line or chain. It was Newton who discovered the interference of light, and was able to measure the wave-length of different colours.

Some time ago it occurred to M. Lippmann that if, instead of a continuous wave of light crossing the photographic plate, a broken line (produced by "interference") were sent across it, the silver, instead of being precipitated in one mass throughout the gelatino-bromide, would settle in layers (about the thickness of a soap bubble). By placing a looking-glass behind the plate, the red light, for instance, caused the silver to be deposited in layers of half the thickness of a red wave length. Blue light would cause the layers to be somewhat thicker wherever it passed, but these layers coinciding, exactly as they do with the length of a wave of light, can only let pass the same light which originated them. This is the whole principle of M. Lippmann's remarkable discovery, and practice shows that it will work in the case of the solar spectrum and of stained windows. Whether it may be applied to landscapes or portraits the future alone can tell; but there is nothing unreasonable in the hope that it will be so.

---

This afternoon, at 4.30, Captain Abney will lecture at the Society of Arts on "Colour."

We are reluctantly obliged to postpone publication of various articles and communications, the pressure upon space being now heavy.

The Derby Photographic Society.—At the annual meeting on Tuesday last at Smith's Restaurant, Victoria Street, Mr. C. B. Keene presiding, the secretary read the annual report and balance sheet for 1890, which showed the Society to be in a fairly prosperous condition.

The *Revue de Photographie* for February gives, as one of its illustrations, a phototypic portrait upon gelatine, produced by MM. Thevoz and Co., of Geneva, from a negative by M. J. Lacroix. No indication is given of the way in which the negative was obtained, but the result, owing to the semi-transparence of the gelatine support, which can be varied in tint as desired, is artistic.

A Spirit Level.—Most of our readers probably know a good deal about the ordinary spirit level, and that it is an instrument the use of which is to get things level and plumb. A new kind of spirit level seems to have been invented in the West, the probable effect of which will be to occasionally get things out of level, and out of plumb. The level is not a very accurate affair, we should judge, for it consists essentially of a pasteboard box with a bottle inside, the bottle containing the spirits and air bubble, which make it a spirit level. No adjusting screws or other refinements are provided, and the "glass" is quite large compared with other spirit levels, and is closed with a cork, so that the amounts of spirits within may be reduced whenever it is thought that the level will work better with less. Any kind of spirits desired may be had, and it is expected that the level will find its chief market in the prohibition States.—*American Machinist.*

## THE ROYAL INSTITUTION.

### Lord Rayleigh on some Applications of Photography.

Last Friday night Lord Rayleigh lectured at the Royal Institution upon "Some Applications of Photography." Sir Frederick Bramwell presided, and among those present were Professor Alexander Herschel, Dr. William Huggins, Mr. William Crookes, Mr. J. W. Swan, Capt. W. de W. Abney, Sir William and Lady Thomson, Lord Justice Sir W. Fry, Professor Hughes, Sir Henry Trueman Wood, Professor Oliver Lodge, Mr. Francis Galton, Professor A. Rucker, Mr. Frederick Varley, Mr. Friese Greene, Professor Dewar, Sir Frederick Abel, Mr. John Spiller, Professor Edward Frankland, Mr. Gambier Bolton, Mr. Roberts-Austen, Mr. Bevan, and Mr. J. R. Götz. The theatre of the Institution was well filled.

Lord Rayleigh stated that there is no such thing as instantaneous photography, because the taking of any photograph must occupy time, however short that time may be. Several methods may be employed to take photographs quickly. Mr. Muybridge had shown in that theatre how he had taken them by means of rapid shutters; another plan is to take them by means of a flash of light. He then caused a flash from a magnesium lamp to fall upon a wheel divided into black and white sectors. This wheel was made to revolve rapidly by means of multiplying gear, and when the wheel was illuminated by the flash the sectors did not appear to be motionless, showing that the flash was not of particularly short duration. It occupied, he said, about one-tenth of a second; other magnesium lamps will give flashes of shorter duration, up to, it is said, a fiftieth of a second.

He then exhibited a method of obtaining a much shorter flash by means of three Leyden jars, charged by means of a Wimshurst's electrical machine. The aforementioned revolving disc was driven at high velocity, and when illuminated by the spark due to the discharge of the Leyden jars, the sectors appeared to be absolutely motionless; they were also sharply defined. The electric spark is, therefore, enormously "more instantaneous" than the magnesium flash.

About twenty years ago, a scientific man in New York investigated the duration of the discharge of the Leyden jar, and found that the result depended somewhat upon the circumstances of the case; a small jar, for instance, gives a quicker spark than a large one. The duration of the spark is about $\frac{1}{25,000,000}$ of a second of time. These figures scarcely enable anyone to realise the velocity except by analogy; one million seconds occupy about twelve days and nights, and twenty-five millions occupy about one year; therefore, the duration of the electrical spark is, to the second of time, about what one second is to a year.

His method of photographing was to obtain the electric discharge in a box with a lantern condenser in front; outside the box, and in front of the condenser, was the transparent object to be photographed; facing this arrangement was a camera, with its lens focussed upon the object.

With this arrangement he had photographed bubbles of gas rising from a nozzle and then ascending through a liquid; in this case, the bubbles form almost at the first moment of leaving the nozzle. With a water-jet in air, the form is at first cylindrical; then the jet breaks into drops at some distance from the nozzle, in consequence of the water-cylinder being in a state of unstable equilibrium, or in what is known in the medical world as a "varicose" state; the varicosity goes on increasing until disruption results.

Another case of unstable equilibrium is that of sensitive flames. The flame is not an essential part of the arrangement, for it acts more as an indicator. He caused a solution of permanganate of potash to play into a solution of protosulphate of iron; the latter was used to quickly decolourise the purple liquid from the jet. This purple jet could be disturbed by shakes and sounds, and the instantaneous photographs taken prove that such jets become sinuous. There is an analogy between these jets and those which produce sensitive flames; there is also a very great difference between them in the forces under which they break up: symmetrical forces will not produce sinuosity.

### The Photographing of Bursting Soap-films.

The lecturer next spoke of a difficult feat, namely, that of photographing bursting soap-bubbles; the chief difficulty is to obtain the bursting of the bubble and the electric flash at the same instant. He caused two electromagnets to hold up two iron bullets, so that when the current was stopped the two balls should fall at the same time, and one of them fall through the soap-film at the same time that the other caused the electric discharge; this did not answer, for one ball would lag a little behind the other in leaving the electro-magnet. He then tried another device, which we shall describe next week, illustrated by diagrams, and accompanied by diagrams of the results obtained.

Another difficulty in this work is, that it is not easy to break a soap-film when you want to do so. Several bullets may sometimes be dropped in succession through a soap-film without breaking it, for they will go through without making a hole. He proved this by experiment. The passing bullet extends the film where it touches it; the film next closes up behind the bullet. Lorn Rayleigh overcame this difficulty by wetting the bullets with alcohol. In these experiments he used an electrometer to indicate when the Leyden jars were sufficiently charged for the purpose.

### The Connection between Aperture and Optical Definition.

The speaker next remarked that we cannot get as high definition as we please by constantly reducing the aperture. With too small apertures the definition gets worse. An optical image of even a mathematical luminous point has considerable extension, and the mathematical point cannot be correctly given at another point by any optical means; there is sure to be a certain amount of diffusion. He had prepared a series of photographs of gratings showing how, as the aperture of the lens was decreased, the images at first improved; but, as the apertures were still farther diminished, the definition began to get worse. Images of these photographs were then projected by him upon the screen by means of the electric lantern. When the aperture is much restricted, a lens is of no use whatever; as good an image can be obtained without as with it. Lord Rayleigh closed his lecture by exhibiting a photograph of some cedars, which he had taken without a lens by means of a hole in a shutter in a dark room, with the plate at a distance of seven feet from the hole. These photographs were of a pleasing nature when viewed at the proper distance of seven feet.

### Photographic Exhibits.

At the close of the foregoing lecture, the following objects of interest were on view in the library:—

Pinhole pictures of the cedars at Terling Place—Lord Rayleigh, M.R.I.; thaumatrope showing formation of water drops—photographs of water drops and of sparks—Professor C. V. Boys, M.R.I.; apparatus used by the French Explosives Committee—Sir Frederick Abel, M.R.I.; photomicrographs of Greek gems and coins—Mr. Wilfrid Godden; photographs of water lilies—Mr. Greville H. Palmer; photographic application of primuline—Messrs. Green, Cross, and Bevan; stereoscopic lantern and camera combined—camera for taking pictures from three to ten a second—direct reading photometer—photographs of clouds—Mr. Friese Greene and Mr. Varley; photographs of animals—Mr. Gambier Bolton; collodion pigeon dispatches—Mr. W. B. Tegetmeier; photograph of a view in winter from Piz Lingard—pigeon post dispatches—Mr. J. Spiller; photographs of moon and eclipse—Mr. F. S. Wells; monochrome portraits of residents in Aden—Mr. C. A. Long; new camera with aluminium fittings—Mr. J. R. Gotz; photographs from isochromatic plates—new camera and developing dishes—Messrs. Griffin & Son; specimens of typographic etching—Typographic Etching Company; Mr. F. Galton's reaction of time chronoscope—Mr. W. Groves; terpuescope lantern—Mr. A. Wrench.

### M. Dagron and the French Pigeon Post.

The illustrations of the French pigeon post, 1870-1871, which were shown in the library of the Royal Institution by Mr. J. Spiller on Friday evening last, are an interesting memento of M. Dagron's unique services in establishing communication between Tours and Paris during the siege and investment of the last-named city. On the 10th of November, 1870, two balloons, appropriately named "Nièpce" and "Daguerre," ascended from Paris, and one of these was immediately captured by the Prussians; but the other, the "Nièpce," carrying M. Dagron and a complete set of photographic apparatus, made a successful journey south, and succeeded in eluding the vigilance of the enemy until the outfit had been safely packed and transferred by its owner to Tours. Here postal messages were received, from first to last, to the number of about 50,000; they were despatched regularly every day to Paris by carrier-pigeons in the following manner: The words of the telegrams and written messages were first set up in common type, and printed in columns so as to form one large sheet; this was then copied by camera and collodion on to a little plate not exceeding $1\frac{1}{4} \times 2\frac{1}{4}$ inches, and from such negative a score or more transparencies in toughened collodion were produced, so as to provide for the failure or loss of the greater number of them. The collodion films were then stripped off their glasses and rolled up into separate parcels for insertion into a quill holder to be carried by the bird, whose ordinary load was a gramme, or twenty pellicles, attached to the feathers of his tail. A pigeon service was established, and the trained birds regularly sent out of Paris by balloon; these returning home again—or a fair proportion of them—carried the news into the beleaguered city. On arrival, the microscopic films were detached and flattened out between two glasses, and either publicly exhibited by the electric lantern, or copied direct by photography on a legible scale, and ultimately distributed to the persons to whom they were addressed. This system of intercommunication remained in force until the withdrawal of the German troops, in 1871, permitted the resumption of the ordinary postal service. In England press messages are usually tied to the legs of carrier pigeons.

## Patent Intelligence.

### Specifications Published.

15,091. *September 26th*, 1890.—"Preparation of Chemicals adapted to the Development of Photographic Plates." Abel M'Donald, 1, Lawn Terrace, Silloth, Cumberland, Photographic Engineer.

In the preparation of developers for photographic plates and the like it is necessary to possess a number of different chemicals, both in crystals and solution, such as liquid ammonia, nitric acid, &c., which are more or less injurious to the health; this necessitates the manipulator to have in possession a number of bottles of solution, from which an accurate portion must be mixed at the time of developing; by the aid of weights and measures, this causes loss of time, risk of breakage, and encumbrance when on a tour.

To dispense with the aforesaid disadvantages, I purpose manufacturing a combination of chemicals into one body possessing the essential properties of a first-class developer.

This I accomplish with the following chemicals, and in the following manner:

I fuse together one part of sodium oxide, three parts of sodium carbonate, and six parts of sodium sulphite, or in other proportion that may from time to time be necessary. I then form the compound into tablets or sticks of a convenient size and weight ready for dissolving in a given quantity of water without the aid of weights or measures.

The advantages of my invention are:—

1st. Being a combination of chemicals in one solid body the photographer does not require to have in stock a number of different chemicals.

2nd. Being of a convenient size and weight it can be readily mixed at the time of use without the aid of weights and measures by any inexperienced person.

3rd. It entirely dispenses with the burdensome practice of carrying developing solution in bottles, as it is used with the dry pyrogallic acid alone, thus the entire chemicals necessary for developing are light, and can be kept in a small compass.

18,369. *November 14th*, 1890.—"Shutters for Optical Lanterns." George Samuel Thompson, 5, Farleigh Road, Stoke Newington, Middlesex, Carriage Builder.

What I claim is:—

1. The plan and arrangement of sliding diaphragms, for magic and other optical lanterns, or combinations of lanterns, having two or more optical systems, whereby rolling up effects and rolling down effects may each be produced twice in succession.
2. The arrangement for a triple lantern whereby the effect of a curtain rolling up or down may be made, cutting off the light from two optical systems, appearing from one, and *vice versa*.
3. The arrangement whereby, after the production of either one or two rolling up effects, from a combination of two or more optical systems, every optical system can be opened free for dissolving purposes without removing the shutter from the lantern or causing a rolling down effect.
4. The arrangement with lanterns of two or more optical systems, whereby after all optical systems have been open for dissolving purposes, one or two rolling down effects can be produced without having either to insert the shutter in the lantern, or produce a rolling up effect.

To Prepare Glue which will remain Liquid.—A certain quantity of finely ground glue of best quality is soaked in a sufficient quantity of alcohol; there must be enough of the latter to always cover the glue. Let the mixture stand for twenty-four hours, and stir from time to time. If the glue does not dissolve entirely, add more alcohol until the desired result is reached. Then pour the liquid glue into a bottle with a wide neck, and keep it well corked. The glue may not be as strong as if it had been boiled, but it will remain liquid, and retain the full force of its adhesiveness.—*The Lithographic Art Journal.*

## Correspondence.

### ROUGH DRAWING PAPER.

Sir,—Dr. Emerson, in his renunciation, refers to my use of rough drawing paper as a "revival," and Mr. Davison, in his reply, remarks that there is no novelty in the use of rough papers. I quite admit this, but papers vary greatly in the degree of roughness they possess, and the paper I employ is the roughest drawing paper procurable, and the same effect cannot be produced on smoother paper. It is my impression that paper of the quality I employ was never used or suggested before the production of the photographs exhibited by me at the Pall Mall exhibition. I may, however, be mistaken, and if so, trust that the gentlemen named will put me right. I enclose a sample of the paper I use, for your inspection.

*Brighton, February 7th.* W. L. Noverre.

### THE RADIAL CAMERA.

Sir,—We observe, in your notice last Friday respecting our Radial camera, that it is stated we issue it with a Voigtlander lens; this is quite correct, but there is an omission that we also supply it with a rectilinear lens fairly good, and a Soho lens, thus giving the choice of three lenses. Your kind correction will oblige. Marion & Co.

*February 9th.*

### PHOTOGRAPHY IN THE CRYSTAL PALACE.

Sir,—On the 4th inst. I wrote a polite letter to Messrs. Negretti and Zambra asking their permission to take a few photographs in the Crystal Palace grounds, promising to make no use of them, except as an amateur, and I have received the enclosed from them in reply.

I bring this before you as I think professional photographers are very short-sighted in their treatment of amateurs, and that if we were to retaliate in a like manner, it might do some of the gentry good.

I may say I am both a shareholder and a season ticket holder in the Palace Company, and it certainly seems unjust that I cannot "openly" take a few shots of any pretty bits that are to be found in those beautiful grounds.

*Camera Club, February 9th.* Robert Schofield.

*Copy.*

Sir,—You will see by the enclosed slip that we have the sole right of photography in the Crystal Palace. To this we may add that we pay *very* large sums of money yearly. Any photographs that may be required we are willing and desirous of taking for our customers at a very reasonable rate, but we cannot, as you will understand, allow any second party to take photographs. During the thirty or thirty-five years we have had the privilege, no one, so far as we remember, has taken pictures in the Palace, although, as you may suppose, many have applied and been refused, and, in some instances, officers connected with the building. We shall be pleased to execute any orders you may favour us with, but permission for you or anyone else to take photographs in the Crystal Palace and grounds cannot be given.—We are, sir, yours truly,

(Signed) J. W. Zambra.

*Crystal Palace, Sydenham, February 6th.*

## Proceedings of Societies.

### The Photographic Society of Great Britain.

On Tuesday evening last, the 10th inst., the annual meeting of this Society was held in the Society's new premises, the president, Mr. J. Glaisher, F.R.S., F.R.A.S., in the chair.

The report of the council was read, and Mr. A. Mackie, in proposing its adoption, remarked upon the greater accuracy with which it had been prepared than had characterised the report of the last and several previous years. The papers that had been read formed a very creditable list. In connection with the reading of papers, he thought more time should be allowed for the discussion. Discussions were often of more importance than the papers themselves; but for the discussions, the papers need not be read, but might only appear in printed form. He had noticed that members of council were supplied with a copy of the paper that was being read, and this gave them an advantage in the discussion which ought to be shared by all the members. The cost of printing the necessary numbers of copies would not be great. As to the technical meetings, he considered that, compared with the meetings of many suburban societies, they were inferior both in the matter of attendance, and of the discussions. He thought this was due to there not being any fixed or pre-arranged subject, and that the secretary or council would do well to amend this. In the details of the report concerning the exhibitions, he observed that, for the last few years, there was a regular decrease in the number of members who sent exhibits. He wished to know how that could be explained; he thought it very serious. It was a thing to rejoice in that the Society had now a home of its own, but he regretted to find that the existence of that home depended upon a guarantee fund, which he thought put poorer members at a disadvantage. He believed that the expenses of the Society might be re-arranged and reduced so as to dispense with the guarantee fund. He thought that the council had exceeded its powers in electing honorary members. When the new rules had been prepared, it was expressly laid down what the powers of the council were, and, although a resolution had been passed a year ago, declaring that certain words in the rules were to be taken to mean other words, it would be better to come before the Society in a constitutional way, and get the rules altered as desired. He thought the council should be greatly enlarged, so that everyone who could be considered a representative man might have a seat on it.

Mr. J. W. Swan proposed an amendment to a paragraph in the report, replacing the words "should be devoted to the scientific rather than the artistic side of photography," by "having been chiefly devoted," &c. This amendment was carried.

Mr. T. E. Freshwater spoke to the desirability of having subjects arranged for and announced for the technical meetings.

The report having been adopted, and the treasurer's report being read, Mr. W. England said that he considered the Society was paying a great deal too much for the printing of the Journal. He proposed that estimates should be obtained from other printing houses.

Mr. G. L. Addenbrooke supported this proposition.

Mr. Mackie referred to the importance of the Society's exhibition in the financial statement, and said that there were rumours of some great photographic exhibition to be held in London. If that were properly carried out it would be disastrous to the Society's exhibition. The Journal involved a net loss of not less than £160, and though he admitted that it had been greatly improved latterly, he did not think it was worth the seven or eight shillings per member which was what it cost.

Mr. L. M. Biden considered that to many members the exhibition was the principal inducement to belong to the Society. The lantern evenings were always crowded, and he thought they might be held two or three times a week, and a charge made to all who attended them. For the sake of the members who did not attend the Society's meetings he thought the Journal ought to be improved, especially in the matter of illustrations.

The treasurer's report was then adopted, and votes of thanks passed to the president, treasurer, secretary, Captain Abney (the editor of the journal), the auditors, and scrutineers.

The President, in replying to the vote of thanks, said that he was much gratified that at last the Society had a home of its own. He was pained to hear complaints about the technical meetings; perhaps in the new home a new start would be made.

Mr. Biden thought that something might be done to federate the numerous photographic societies now existing. The railway companies might be approached to grant concessions for society outings similar to those given to angling clubs. Interchange of papers and other matter, too, might be arranged. Would the Society grant the use of its room for a meeting to discuss these things?

The President said that doubtless the council would accede to this request.

Mr. L. Warnerke said that he had been requested to give a demonstration of collotype printing, and it occurred to him that it would be better to choose an extra night for this purpose, and that a series of demonstrations and lectures on extra nights might be arranged. In this way the Society would commence in some degree the kind of work that the proposed Institute, when formed, would be expected to carry on.

Mr. W. E. Debenham supported this proposition, and assumed that these lectures and demonstrations would not be expected to be dependent on any fresh discovery made by the authors, but might take the form of lectures such as would be delivered at any institute of instruction.

The election of members of council resulted as follows:—*President*—J. Glaisher, F.R.S., F.R.A.S.; *Vice-Presidents*—Captain W. de W. Abney, C.B., R.E., D.C.L., F.R.S., T. Sebastian Davis, F.C.S., H. P. Robinson, and John Spiller F.C.S., F.I.C.; *Treasurer*—W. S. Bird; *Members of Council*—Messrs. W. Ackland, G. L. Addenbrooke, W. Bedford, V. Blanchard, F. Cobb, A. Cowan, T. R. Dallmeyer, Major L. Darwin, R.E., G. Davison, W. E. Debenham, W. England, J. Gale, F. Hollyer, F. Ince, Dr. L. Johnson, H. Chapman Jones, F.I.C., F.C.S., Captain Mantell, R.E., J. W. Swan, J. Traill Taylor, Leon Warnerke, and Sir H. Trueman Wood.

---

### The London and Provincial Photographic Association.

*February 5th.*—Mr. W. H. Cooke in the chair.

The Hon. Sec. presented "Inorganic Chemistry" (Meldola) to the library of the Association. Several volumes of the Photographic News Year-Book and the "British Journal Almanac" were also received from Mr. Charters-White.

Several specimens of Mr. E. Dunmore's "unique" black and white cloud negatives were passed round. The negatives were artificially produced on tissue paper with powdered plumbago and a stump, quick printing being one of the chief advantages claimed for them.

The Hon. Secretary showed the results he had obtained from some stripping films by first soaking them in bromide, and developing with ferrous oxalate. He also exhibited some prints on Fry's naturalistic paper; the effect on this paper is only seen when the print is held at some little distance from the eye.

A question from the box was read:—(1) "What, in the opinion of this meeting, is the best means of preserving for, say, one week's use, a one in ten solution of pyro and distilled water, so as to maintain its developing power most nearly equal to that of dry pyro? (2) Would the loss of developing power in such a solution be compensated by the use of a greater quantity of acid; if so, in what proportion would the amount require to be augmented?"

Mr. W. E. Debenham said pyro and plain water alone would keep for a week in a corked bottle. He preferred using water that had been boiled.

Mr. A. Haddon referred to some crystals of eikonogen that he had sealed in a glass tube a year ago and exposed to light. The crystals had undergone but very little change in colour.

The letter from the Photographic Society of Great Britain on the subject of the Photographic Institute was then read and fully discussed. The following resolution was passed: "That the establishment of the Institute, as proposed by the Photographic Society of Great Britain, is very desirable, and would be conducive to the progress of photographic science and industry."

The Hon. Secretary announced that on March 3rd a popular lantern exhibition would be given, to which visitors were invited.

---

### The South London Photographic Society.

*February 6th.*—At the meeting at Hanover Hall, a demonstration of enlarging on bromide paper was given by Mr. S. Wiles, using paper prepared by himself. Enlargements previously exposed to daylight were developed, and produced excellent results.

### The North Middlesex Photographic Society.

*Feb. 9th.*—Jubilee House, Hornsey Road.

Mr. Walker, the chairman, said that the subject for the evening was "The Best Treatment for Winter and Snow Scenes." He thought that views in which there were no heavy objects in the foreground were best, and a developer weak in the reducing agent most suitable.

Mr. Mummery had found that when the sun shone in winter there was more light than at first appeared by reason of reflection from the snow. He used Thomas's hydrokinone developer full strength.

Mr. Norris had given fifteen to twenty seconds with large stop, and developed with full strength pyro and ammonia.

Mr. Beadle had given fifteen seconds with $f/32$ on a hoar-frost view, and developed with pyro (Ilford formula) used full strength.

Mr. Gill showed some instantaneous pictures of figures in snow scenes taken at 8·30 a.m. in December, and developed with ferrous oxalate, the iron weak at first, and strengthened as development proceeded. The prints were much admired.

Referring to the widely different exposures, Mr O. Cox had seen negatives taken under similar conditions, but with exposures varying from four seconds to five minutes, yield equal results in the hands of an experienced developer. He warned the members that lenses kept in a cold place and taken into a warm, moist atmosphere would condense moisture on the surface and give trouble, the cause of which might not be suspected.

Mr. Goodhew recommended in cases of great contrast, as in snow scenes, that the plate should be flooded with the ammonia and bromide, and the pyro added by drops till the image appeared. When all detail was up, a new developer, strong in pyro and bromide, should be used to secure density and brilliance.

The Secretary had used eikonogen and ammonia with meta-bisulphite.

Mr. Pither had failed to get density with the weak pyro method.

Mr. Gill showed two hand-cameras of his own invention. The construction was ingenious, and the method of changing the plates simple and certain. One was for half-plates, which could be used on a tripod, and also for stereo views.

---

### The Richmond Amateur Photographic Society.

This Society, whose numbers are steadily increasing, has now started weekly meetings (instead of fortnightly as hitherto), at the "Greyhound Hotel," a more central and convenient location than the former quarters. The first meeting under the new arrangement took place on Friday last, a lantern night, when Mr. F. P. Cembrano, jun., handled the lantern, and slides by Messrs. Hunter, Faulkner, Richardson, Ardaseer, and Cembrano were shown and discussed, those of the last-named consisting of a series of views in Chester and North Wales, taken during last year's Photographic Convention.

At the next meeting (Friday, 13th), Mr. C. Hussey will give a demonstration of the collodio-bromide process for lantern slides and transparencies. On Monday, the 16th, Major J. Fortuné Nott, President of the Society, will give a lecture, with lantern illustrations, on "Wild Animals in Captivity," at 8 p.m., in the Lecture Hall, Hill Street.

---

### The Leeds Photographic Society.

At a meeting on Thursday evening last Mr. Godfrey Bingley, president, occupied the chair.

Mr. C. H. Bothamley delivered a lecture entitled "A Good and Bad Photograph." In introducing the subject, Mr. Bothamley referred to the absolute necessity for every photographer making himself acquainted with the leading rules of art; although it was impossible for a picture to be made artistic by a rigid observance of rules, yet, unless they were obeyed, except in a few exceptional cases, it was impossible for a picture to be pleasing, and, in a clear and interesting manner, Mr. Bothamley pointed out the necessity of the rules of composition and light and shade, illustrating his remarks by diagrams on the blackboard and a large number of choice lantern slides thrown upon the screen, thus bringing before his hearers the leading points in his address.

At the close of the lecture, a vote of thanks was passed to Mr. T. W. Thornton, the retiring president.

The Croydon Microscopical and Natural History Club (Photographic Section).

*February 6th.*—Mr. John Weir Brown in the chair.

Mr. J. Howson gave a demonstration on bromide and alpha papers.

This was the first demonstration of the kind that had taken place in the Club's newly-acquired dark-room.

The Glasgow Photographic Association.

*January 29th.*—The second popular meeting was held in the large hall of the Philosophical Society's Rooms, 207, Bath Street, Mr. William Lang, jun., in the chair.

M. A. Lindsay Miller gave an interesting and instructive lecture, entitled "Architecture from the Earliest Times to the Present Day." The lecture was illustrated with limelight views of the chief buildings of ancient and modern times; the features and characteristic style of each were fully explained by the lecturer.

*February 5th.*—The fourth general meeting, in the Philosophical Society's Rooms, 207, Bath Street. Mr. William Lang, jun., in the chair. The following were unanimously elected members: Messrs. J. T. Bottomley, M.A., F.R.S., A. Neilson, J. Adamson, jun., and W. M'Whirter.

Specimens of flash-light portraiture were exhibited.

A communication from Mr. A. Pringle (honorary member) on "Albumen Slides" was read by the Secretary, and a paper on "The Optical Lantern, its History and Development" (see page 129), was given by Mr. Lang.

A lantern exhibition of slides prepared by the method advocated by Mr. Pringle, and a collection of Ferrier and Senlin's slides, brought the proceedings to a close.

Received.—From the Scovil and Adams Company, N.Y., "A Cyclopedic Index to the *Photographic Times* Almanac for 1891," compiled by Prof. C. Ehrmann. This is a supplementary publication to the almanac, to which it is a fuller index than is given in the book itself. It contains useful information, arranged conveniently in alphabetical order. The same firm sends also a framed copy of the patented "Dial Calendar for 1891."——From Messrs. Hazell, Watson, and Viney, "Evening Work for Amateur Photographers," by T. C. Hepworth, and the "Art of Retouching," by J. Hubert. The name of the author is sufficient guarantee of the excellence of the first-named work, which contains valuable information educationally important to the modern amateur photographer as to the profitable occupation of his time during the winter months, and at times when no dependence can be placed on daylight. The book is divided into nineteen chapters extending to 196 pages, and is well illustrated with camera and pencil by the author. Mr. Hubert speaks with acknowledged authority on the subject he has taken in hand, and adds to his information on retouching, some chapters on portraiture and flash-light photography. The book contains a Woodburytype reproduction from a negative before and after retouching, as well as other illustrations in elucidation of the matters dealt with.——From Kegan Paul, Trench, and Co., *Sun Artists* for January. Mr. B. Gay Wilkinson is the subject of the descriptive essay, and the plates are from his four photographs entitled respectively, "Sand Dunes," "Prawning," "A Pastoral," and "A Windy Corner." The writer of the essay, Rev. F. C. Lambert, draws a parallel between Gay, the "poet born" and "word painter," and Mr. Wilkinson, who having community of blood and lineage with the poet, shows also, in his pictorial expressions, some measure of the "poetic fantasy in nature's boundless store."——From the Crystal Palace Company, a notice paper and entry form of the forthcoming National Photographic Exhibition to be held at the Crystal Palace from Monday, April 13th, to Saturday, May 2nd next.

# Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.**

**All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

C. C.—*Prints in Black and White.* There is no aniline process applicable to such a purpose and giving a jet black. The best method of sun printing should be either the platinotype or carbon process; but in the event of a large number of copies being required, one of the photo-mechanical methods of reproduction ought to be resorted to. This may be either collotype, bitumen process, or by photo-zincography, much depending upon the character and average size of the originals, and number of copies desired. By giving us further information upon these points, we may be better able to advise you.

T. P.—*Lord Rayleigh's Wire-gauze Experiment.* The object was to show that, by diminishing the size of the pinhole in the card, within certain limits, the structural definition of the wire gauze, as seen through it at a distance of three or four feet, becomes impaired. In like manner it was quite possible to use too small a stop with a lens, and so deteriorate its defining power; in fact, it might come to be worse than using no lens at all. The reference to astigmatism was centred in the fact that the same little contrivance could be used as a test for discovering this imperfection in the human eye. By examining the wire gauze in different positions between vertical and horizontal, any visual defect makes itself at once apparent, and the angle of imperfect definition could be noted.

Tyro.—*Cotton Wool Vignettes.* The stained oval glasses seldom give the best results. Each portrait requires specific treatment, and nothing is better than a thick card with oval aperture and gummed edges, upon which cotton wool fibres may be arranged and drawn out to suit the requirements of each negative about to be printed. Some prefer to use a double card with the loose cotton wool filled in between the two layers.

S. E. N. (Wisbeach).—*Impurities in Sulphites.* By long keeping in imperfectly stoppered bottles, sulphites are apt to become further oxidised, slowly passing into sulphates. To test for this latter impurity in any sample, dissolve it in distilled water, and add hydrochloric acid and chloride of barium, when the formation of a heavy white precipitate at once indicates sulphate. Small quantities are often met with, and may be disregarded.

A. L. (Ryde).—*Coloured Mounts.* According to the effect desired, you may either choose a tone which harmonises with the middle tints in your print, or shows a perceptible relief by contrast. Avoid violent variation, or too pronounced a colour for the mount, which is always distasteful.

F. C.—*Foreign Membership.* By the rules, if a member goes abroad and remains absent from this country for any length of time—notice of such intention having been given to the secretary—he is excused from payment, but the official papers are not forwarded.

Eastcheap.—*Plain Paper Printing.* The information you were seeking for is all to be found at pages 71 to 73 of the "Photographic Printers' Assistant" (price one shilling), published by Messrs. Piper and Carter. It is advisable to use a little gelatine, and ammonio-nitrate of silver is preferable; but you would find it rather tedious to apply this with a brush. A fine quality of cartridge paper ought to suit your purpose.

H. G. W. (Shoreditch).—Kershaw's instantaneous shutter answers to the description given in your letter.

Wanted, on loan for a few days, or to know where a copy of Messrs. Sutton and Dawson's "Dictionary of Photography" can be obtained.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1694.—*February* 20, 1891.



CONTENTS.



## PROFESSOR LIPPMANN'S NEW DISCOVERIES IN HELIOCHROMY.

Since last Friday some additional particulars about M. G. Lippmann's discoveries in relation to photography in natural colours have come to hand, and we give them in the order in which they have been received, reserving comment until the end.

The facts were first made known on the second of this month, at a meeting of the French Academy of Sciences, under the presidency of M. Duchartre, and much about them was published in these pages last week. The following is the notice of the meeting published in last week's *Nature* :—

On Photographing in Colours, by M. G. Lippmann.

The conditions said to be essential to photography in colours by M. Lippmann's method are : (1) a sensitive film showing no grain ; (2) a reflecting surface at the back of this film. Albumen, collodion, and gelatine films sensitised with iodide or bromide of silver, and devoid of grain when microscopically examined, have been employed. Films so prepared have been placed in a hollow dark slide containing mercury. The mercury thus forms a reflecting layer in contact with the sensitive film. The exposure, development, and fixing of the film are done in the ordinary manner ; but when the operations are completed, the colours of the spectrum became visible. The theory of the experiment is very simple. The incident light interferes with the light reflected by the mercury ; consequently, a series of fringes is formed in the sensitive film, and silver is deposited at places of maximum luminosity of these fringes. The thickness of the film is divided according to the deposits of silver into laminæ whose thicknesses are equal to the interval separating two maxima of light in the fringes—that is, half the wave-length of the incident light. These laminæ of metallic silver, formed at regular distances from the surface of the film, give rise to the colours seen when the plate is developed and dried. Evidence of this is found in the fact that the proofs obtained are positive when viewed by reflected, and negative when viewed by transmitted light—that is, each colour is represented by its complementary colour.—Observations by M. E. Becquerel on the above communication. M. Becquerel called attention to the experiments made by him on the photography of colours in 1849. His researches, however, dealt more with the chemical than the physical side of the question.

Last Monday we received a letter from our Paris correspondent, M. Léon Vidal, in which he says that he has had occasion to see M. Lippmann, who has shown him his results; he then had a better opportunity of examining them than was the case with those exhibited at the Photographic Society of France, and the spectrum was very well rendered in those which he saw at the Sorbonne. M. Vidal adds that when M. Lippmann possesses plates sensitive to the red rays, and when his present results are improved upon by experience, the images will be more complete; moreover, it remains to be seen what will take place when he uses compound colours, above all with a mixture of white light. He has made a beginning, and new developments must be patiently awaited; he will not be dilatory in the work. One result attained by the experiments of M. Lippmann is, that the polychrome impressions obtained by M. Becquerel, and by his imitators, Niépce de St. Victor, Poitevin, and others, appear all to be due to the physical phenomena presented by the interference of light; this is one of the most curious consequences of this fruitful discovery.

M. Vidal says, in a letter which we received yesterday, that, so far, those plates have worked best in M. Lippmann's hands which were prepared by the old Taupenot process; such dry plates, some of our readers may remember, had upon them one film of albumen and another of collodion. The plates should be orthochromatic, especially for the red rays, otherwise the time of exposure becomes too long. In photographing the spectrum, M. Lippmann uses an arc light of eight to nine hundred candle power, with the usual condensers, slit, and prisms. The colours presented by the finished photograph much resemble those of the soap-bubble. M. Vidal sends other particulars, but they are the same as those included in a memoir by Professor Lippmann upon another page of this issue.

Up to this date M. Lippmann has not published any definite working formula, but if his hypothesis of the nature of the coloured image be true, it is easy for every photographer to devise his own methods, and we will now give some speculative suggestions on the subject which may or may not hereafter prove to be erroneous.

In the first place, it seems evident that dry plates alone can be used to permanently photograph interference fringes in parallel layers, because any damp film would contract on drying, and bring the fringes nearer together, so that they would no longer permit the true colour to be reflected. In development the film will swell, but this does not matter if it returns to its original thickness on drying.

Any colour in the sensitive film before exposure one would think to be objectionable, because it would prevent some of the rays reaching the back of the film to cause interference by reflection from the mirror. This, perhaps, may account for iodide of silver having been found worthless in heliochromy in the days of old; it does not, however, explain M. Lippmann's statement to the correspondent of the *Daily News*, that he used iodide of silver in albumen. According to the working hypothesis, it also seems desirable that the developer employed shall give a pure neutral black tint by transmitted light, a silvery-white one by reflected light, and not a deposit possessing a special colour of its own. There should be no actual colour in the finished image, but the colours seen should be entirely due to the breaking up of the waves of incident light by interference.

No doubt Professor Lippmann prepares all his plates by dipping, and we suspect that they are thinly coated; whatever the thickness of the dried film, the amount of that thickness is of vital importance in getting the best results. The more particles there are in the film, the more will they scatter the light and deteriorate the system of hypothetical fringes; hence, the more transparent the sensitive layer the better. As fluoride of silver is soluble in water, and forms a colourless solution, it is possible that with this salt and an organic vehicle an absolutely transparent dry film may be prepared, and, should it be suitable photographically, it might turn out to be the best possible salt in the working of M. Lippmann's process. It is a salt somewhat liable to attack glass plates, so surfaces of polished silver would have to be coated with the sensitive layer; indeed, it is possible that M. Lippmann would get on better now by using silver plates, instead of giving ordinary photographic plates a backing of mercury next the film. Fused fluoride of silver is elastic, and can be cut with scissors, but it is black in thick films. Robert Hunt found fluoride of silver to be useful in heliochromy, and, if we remember aright, Messrs. Crookes and Spiller, a quarter of a century ago, investigated the value of fluoride of silver in ordinary photography.

At present, Professor Lippmann's plates are least sensitive to red light, and not highly sensitive to any of the rays of the spectrum; consequently, development can be carried on in red light. Should hereafter more sensitive films be formed, a suitable light for developing is likely to be that transmitted by superimposed sheets of cobalt glass and copper-oxide ruby glass. These will give the light of the very extremity of the visible red of the spectrum.

Professor Lippmann has given a great impetus to heliochromy by producing evidence tending to prove that the colours of the photographs are those of thin plates, and that they can be fixed.

## PHOTOGRAPHING JETS AND BURSTING SOAP FILMS.

OWING to the kindness of Lord Rayleigh in lending the original photographs, we are enabled now to give outline illustrations, photographically produced upon the blocks for the sake of accuracy, of some of his results in what the Americans call "lightning" photography. The substance of his lecture a fortnight ago at the Royal Institution on the subject was published in these pages last week.

Fig. 1 represents a jet of air blown up through water, and photographed by the electric spark; in this case it will be noticed that the jet breaks into bubbles close to the nozzle of the pipe.

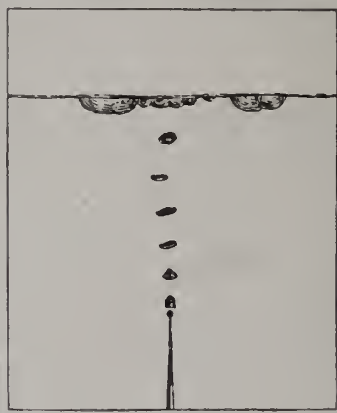


*Fig.* 1.

*Fig.* 2.

Fig. 2 is a jet of water falling vertically in air, controlled by a tuning fork, which throws the object into periodic vibrations synchronous to itself. The water does not break into drops close to the nozzle; it first forms an unstable cylinder, and each drop, before it quits the cylinder, is connected with it by a ligament. This ligament gathers itself into a little drop, which travels faster than the large one before it, and sometimes catches it and "cannons" with it.

*Fig.* 3.

Fig. 3 represents the plan adopted to burst a soap film while it is illuminated by an electric spark; the duration of the latter is about the $\frac{1}{32000000}$ of a second; the rupture of the soap film occupies about $\frac{1}{300}$ of a second, and these two events have to be made to occur together. A bullet is held against a piece of wood by a spring; to the spring a piece of soft iron is attached; when the latter is attracted by an electro-magnet, the spring is pulled back and the bullet falls. Two pieces of apparatus like this are employed, so that when an electrical current is sent, two bullets fall at the same instant; the one ruptures the film, the other completes the electric circuit sufficiently to allow the spark to pass.

Fig. 4 represents a soap film in the first stage of disruption, fig. 5 in the second stage of disruption,

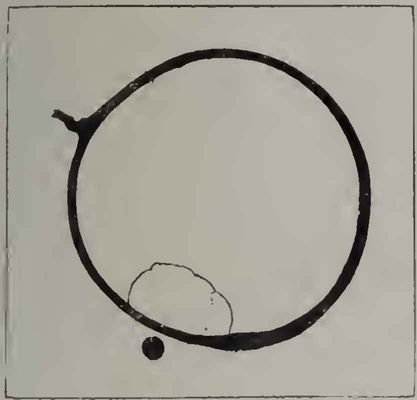


*Fig. 4.*

and fig. 6 in the third stage. The falling bullets are photographed in each case. The shots at the moment of touching the film had attained a velocity of about

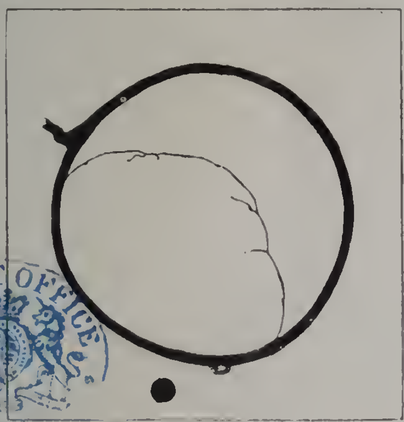


*Fig. 5.*

8 feet per second; the velocity of contraction of each film was about 48 feet per second.

The soap solution used, and which gives films of considerable durability, consisted of a solution of three

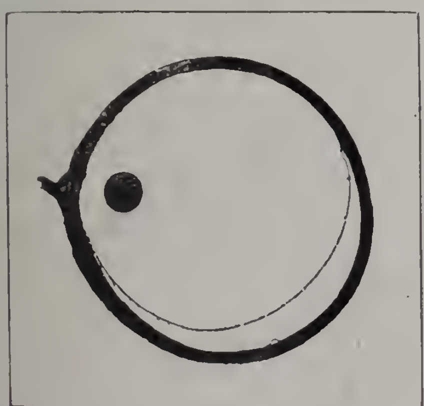


*Fig. 6.*

per cent. oleate of soda and twenty-five per cent. glycerine. The iron wire rings supporting the films were coated with solid paraffin; the films are more durable when supported by paraffin.

## THE BLOW-THROUGH LIME-LIGHT JET.

Ten years ago the lime-light was used almost exclusively by professional lecturers; but since oxygen gas has no longer to be made for the purpose, but is supplied compressed in bottles as a commercial commodity, the light is employed by many hundreds of amateur workers, either as a luminant for the optical lantern, or as a source of light by which to enlarge photographs. Hence the choice of a suitable jet—by means of which the two gases employed can be made to impinge upon the lime cylinder—becomes a matter of great importance to many. We propose to offer a few remarks upon the different kinds of jets available, and to point out the advantages or disadvantages pertaining to each.

Lime-light apparatus has of late been so perfected that the question of danger in its use may be almost, if not quite, eliminated. Accidents—and sometimes bad accidents—used to happen; but these were generally traceable to some malpractice in separating the oxygen gas from the compound with which it was associated, or to accidental admixture of hydrogen with oxygen in the bag or bags employed. We may now rely upon the gas supplied in cylinders being quite free from any such dangerous admixture, for the nozzles of the two bottles are furnished with right and left screw threads respectively, so that neither of them will fit the supply pipe of the compressing apparatus which is not intended for it. By this provision absolute immunity from this source of danger is secured. The substitution of cylinders for bags also obviates a number of minor risks, which it is not necessary to mention in detail.

In the choice of a jet the operator must be guided by his requirements. If he wish to be able to enlarge photographs, with the ability to show a few pictures occasionally by means of the optical lantern, and if he be content with the use of a screen or sheet about twelve to fifteen feet square, the blow-through or safety jet will suffice for all his needs. There is now no reason why this form of jet should be distinguished by the word "safety"; but the term is an attractive one to the tyro, and no doubt induces many to adopt that form of burner in preference to others. But the blow-through jet has other recommendations of a far more tangible nature. One of the necessary gases is obtained by the simple expedient of fixing an india-rubber tube to the nearest gas burner, and leading it to the hydrogen side of the jet. A cylinder of oxygen supplies the other gas, and by no combination of accidents can the two gases mix until they reach the point of combustion at the lime cylinder.

But in the choice of a blow-through jet some judgment is required, for many different patterns are in the market, and one kind will give quite double the light of its fellow without more expenditure of gas. A slight difference in construction makes all the difference. The cheapest—and, perhaps, the least efficient—form is where the O and H tubes are quite separate, and where the former bends over towards the mouth of the latter and projects a blow-pipe flame on to the lime. It is easy enough to manage, and, do what you will, you cannot make the flame go out with that sharp crack which sounds so ominously of coming disaster to nervous listeners. Far better is that form in which the oxygen outlet tube is embraced by the wider hydrogen tube, so that when you look down the latter you see the oxygen pipe hidden about one-eighth of an inch from the general outlet of the jet. In this case the gases mix, to some extent, before the lime cylinder is reached, and the gain of light from this circumstance is great.

Another point to which we may direct attention is the necessity for seeing that the bore of the O tube is something more than a pinhole. It should be sufficient to pass not less than four and a-half feet of gas per hour under moderate pressure. A less amount than that cannot give a good light.

But, with all these things provided for, some operators do not get the best out of their jets because they do not place the lime cylinder close enough to the outlet pipe. The distance between jet and pipe should never be more than one-eighth of an inch. Careless workers fall into another fault in neglecting to turn the lime cylinder every few minutes as it ought to be turned. The loss of light from this common error is enormous, with the farther serious risk of breaking the condenser of the lantern; for if a pit be formed in the lime, the flame will often be bent back towards the glass, and will fracture it. The successful operator with the lime-light must be continually on the alert to see that he is getting due efficiency from his jet. The gases must be regulated to a nicety until a point is reached when they give the best possible light without noise, and this point can only be ascertained by watching the effect upon the screen as the taps are manipulated. The lime must be turned to a small extent, but often; and the jet should have an arrangement by which this can be done easily, and without opening the door of the lantern. There are jets in the market which possess all the faults against which we have warned our readers, and we can only suppose that they are constructed from time-honoured models by those who can have had no practical experience of the lime-light.

In another article we shall treat of the more powerful mixed jet for lantern use.

---

The New Discovery in Heliochromy.—In an article in the *Daily News* of last Monday, its special correspondent at Paris says:—"I have had another conversation with Professor Lippmann, of the Sorbonne. The colours are permanent—he made use of the word "fixed"—and they are only seen by reflection in looking at the plate, and not through it. One sees the colours well in daylight or lamplight, but better in reflected than in direct artificial light. Thus, the professor covered the back of a glass plate on which he photographed a spectrum, and held the face towards the white side of a paper lamp-shade. In the light it threw back on them the colours took such a brightness as to be only comparable to the prismatic hues in a well-cut Golconda diamond. When he held the plate between my eye and the light I did not see a trace of colour on it. I never saw any effects more neat and perfect than those he has obtained. M. Lippmann has been at the Sorbonne five years."

## PHOTOGRAPHY IN COLOURS.*

BY PROFESSOR G. LIPPMANN.

I have set myself to the task of obtaining upon a photographic plate the image of the spectrum with its colours, in such a fashion that the image shall be permanently fixed, and last indefinitely in full daylight without alteration.

I have resolved this problem by operating with the ordinary sensitive substances, and photographic developers and fixing solutions, modifying simply the physical conditions of the experiment. The conditions necessary to obtain colours in photography are two:—1. The continuity of the sensitive film. 2. The presence of a reflecting surface behind this film.

I mean by continuity the absence of granularity; it is necessary that the iodide, the bromide of silver, &c., shall be disseminated in a film of albumen, gelatine, or other substance transparent and inert, in a uniform manner, without forming particles visible even under the microscope; if particles be present, it is necessary that they should be of neglegible dimensions in relation to the length of a luminous wave.

The coarse emulsions hitherto used must be excluded. A continuous couch is transparent, but usually has a slight blue opalescence. As vehicles to the sensitive salts I have used albumen, collodion, and gelatine; as sensitive agents, iodide and bromide of silver; all these combinations give good results.

The dry plate is placed in a grooved frame into which mercury is poured; the mercury forms a reflecting surface in contact with the sensitive film. Exposure, development, and fixing are the same as with an ordinary black negative, but the result is different; when the negative is finished and dried, the colours appear.

The image obtained is negative by transmitted light, that is to say, every colour is represented by its complementary tint. By reflection it is positive, the colour itself can be seen, and it can be obtained very brilliantly. To turn it into a positive, the image must be redeveloped or intensified, until the photographic deposit has a bright colour, such as can be obtained, it is said, by the employment of liquid acids.

Fixing is done by means of hyposulphite of soda, followed by careful washings. I have verified that the colours resist the action of the most intense electric light.

The theory of the experiment is very simple. The incident light, which forms the image in the camera, interferes with the light reflected by the mercury. It forms, consequently, in the interior of the sensitive film, a system of fringes, that is to say, at the maximum of luminosity and the minimum of obscurity. The maxima alone impress the plate; as a result of the photographic operations, these maxima remain indicated by deposits of silver more or less reflecting, which occupy their place. The sensitive film is thus divided by these deposits into a series of thin plates, equalling in thickness the interval which separates the two maxima; that is to say, half a wave length of the incident light. These thin films possess, then, precisely the thickness necessary to reproduce by reflection the incident colour.

The colours visible are thus of the same nature as those of the soap-bubble; they are only more pure and more brilliant—at least, when the photographic operations have given a good reflecting film. This results from the formation in the thickness of the sensitive couch of a great

* Read at the Academy of Sciences, Paris, February 2nd, 1891.

number of superimposed thin plates; about 200, for instance, if the couch has the thickness of one-twentieth of a millimetre. For the same reasons, the reflected colour is more pure as the number of reflecting films augments. These layers form, in effect, a sort of grating in depth, and for the same reason as in the theory of the action of gratings by reflection, the purity of the colours increases with the increase in the number of elementary mirrors.

---

## NOTES ON PORTRAITURE.

BY H. P. ROBINSON.

No. V.

There still remains something more to be said on the subject of "motive" in portraiture.

The question to be solved is whether the sitter should be represented as sitting for his portrait or doing something else. The former would be the absolute truth, and is often stiff; the latter must be the result of more or less make-believe, and may look natural. The one would be truth absolute, the other a slight falling away from that—in art—mysterious virtue. Now, here is a problem for the impressionists who insist on the whole, entire, rigorous truth. Which will they have: the truth, or something artificial so well done as to look more truthful than the truth itself? Without attempting to decide the question, I will endeavour to point out the practice of some of the great masters of portraiture. As it fortunately happens, there have just been added to the national collection, at enormous cost (£55,000), three pictures containing portraits by three painters who are recognised, by all shades of artistic opinion, as among the very greatest. The only subject on which all are unanimous is that Holbein, Velasquez, and Moroni are among the first half-dozen of the great portrait painters of all ages. These portraits have also the advantage of showing the contrasting styles of three separate phases of the art. An admirable and exhaustive article by Professor Colvin, accompanied by excellent engravings of the pictures, in the January number of the *Art Journal*, should be seen by all photographers. To this article I am indebted for a few extracts. In the Holbein we have an example of "the early maturity of northern art, when the grotesque strenuousness of the primitive Teutonic manner has been mellowed by the influences of the Renaissance, and a complete power of draughtsmanship has been attained, with a masterly precision in rendering both the characters and forms of humanity, and the appearances of natural objects in detail; but when the painter has not yet thought of attempting fully to express the relief of objects in space, nor their relations to each other as affected by the environing atmosphere. Of this phase of northern art Holbein is the chief master. It is he who best combined the accomplishments of the Italian Renaissance with the inherited energy and unsparing precision of his own school."

Looking at this picture for our present purpose—"motive"—what do we find? Two figures standing stiffly at each side of a high table, or, as it would now be termed, a "what-not." Both figures have their arms resting on the table, and both are set up to be painted, and both are "staring at the camera." Professor Colvin says that Holbein, who, in decorative and ornamental design, was one of the most inventive, adroit, and powerful composers that ever lived, has, in this instance, seemed to let his composition take care of itself. The figures are placed at either end of the desk with a certain *naïf* stiffness, almost recalling the pose of a photographic group. This is not flattering to the photographic group, but the attitudes are characteristic of the artist's portraits.

The second picture is Italian, and belongs to the Venetian school. Moroni is already well represented in the gallery by several portraits. Especially distinguished are the full-length "Portrait of an Italian Nobleman," and the famous "Portrait of a Tailor." Keeping to our purpose again, we shall find that, in the new Moroni, the figure is posing for his portrait, and "staring at the camera," while he has evidently had one of those marble columns, which we have banished from photography, broken to afford him a place on which to rest his helmet. It must be admitted that Moroni varied his practice, and sometimes represented his figures in action or suspended motion. Of this, "The Tailor" is a good example. In this portrait the man, who has been cutting cloth with a shears, is represented looking up from his occupation at the spectator.

The third picture, by Velasquez, is, perhaps, the most interesting of the three to the painter. Professor Colvin shows us how much can be said of a simple portrait. I quote a part only of his eulogy:—"In the last picture of the three we have no case of piling up of details; of the patient and strenuous imitation, part by part, of nature's multiplicity, with subordination and harmony imposed, as it were, from the outside by an effort of the artist's will and craft. We have the result, triumphant and in seeming more spontaneous, of what is really a far more complicated artistic process. . . . And this is an example of Velasquez at his best. Something of the rugged, flashing power and fierce eagerness of the sitter seems to have passed into the painter's hand, and the method of execution he has chosen emphasises and harmonises with the character of the subject. The rude soldier-sailor in his handsome suit stands in bodily and spiritual presence before us, and seems snorting with impatience to be off to the fight once more."

For technical qualities and assured mastery of the brush this picture is amazing, but with this we have nothing to do. Our enquiry is, how did the painter allow his sitter to stand for his portrait? He stood upright against a blank grey wall, nothing more nor less. The painter probably advised him not to stand too stiffly, just as a photographer may do, and painted him. Let it be noticed that in this case, also, the sitter "stares at the camera;" this time it is a scowl, and some photographers would have the presumption to say that the head was badly lighted, that there was too much top light, and that the head was under-exposed.

I, of course, have not brought forward these examples for the purpose of inducing the photographer to pose his figures stiffly because great masters of painting did so. These masters were great for other qualities, the attainment of some of which is not open to the photographer; such as colour, and the power (which some call a vice) to idealise their sitters; and some qualities which are within his reach—if his arm is long enough—such as expression, and the bringing out of character. The good name of photography is always suffering for the faults of its followers. It is not always the fault of the art, but of the artist, when the leading characteristics and sometimes the character of the sitter is not brought out; but it must be confessed that few have the ability to exercise this power. Rejlander had it in perfection, although we are told by a writer in the *Quarterly* (who has probably not seen) "there is little of art to be seen in the past history of photography."* I give these examples to show that great painters did not always strive after making their sitters "doing something," and looking away from the camera; that they, in fact, frankly accepted the situation, and painted the man as he was—that is, standing for his portrait.

Now let us examine the practice of one or two other portraitists. The next of my examples in order of date is Sir Peter Lely. All will acknowledge that his art was greatly inferior to that of the painters I have mentioned. He usually represented his sitters occupied with some employment, never at rest, and as often as not as somebody else. For examples, see his celebrated portraits of Charles II.'s beauties at Hampton Court, "Princess Mary as Diana," and many others. Here we have action enough and to spare, but it is very artificial and make-believe. Then we come to Sir Joshua Reynolds and his contemporaries, great men in English art, especially portraiture. When they posed their sitters easily, and simply painted them, using, however, their knowledge of art in the posing, they made great pictures, which are the envy and admiration of the painters of the present day, and the choicest possession of the millionnaire; but when they went beyond this, and set their figures to work, the amount of action they gave them was the measure of their failure. Exception must be made in favour of such slight action and occupation as is shown in the wonderful portrait of "Lord Heathfield with the Keys of Gibraltar," by Sir Joshua, but when it extends to the amount visible in a picture by the same great hand in "The Graces Decorating a Terminal Figure of Hymen," in which three healthy young Englishwomen are posing in affected attitudes as mythological young persons for the purpose of having their portraits painted, the dignity of "doing something" is doubtful.

So it will be seen that there are examples of great painters working in both directions, and that some have erred in the direction of common-sense, and, painting a portrait *as* a portrait, have found stiffness; others, trying to escape the prosaic, deviating into what they thought was grace, gave their sitters a motive—and failed.

The moral of all this is, that photographers did not invent stiff attitudes or bathos; the lesson is, that when photographers take a portrait they should accept facts, and understand that their duty is to produce a presentment of the individual—this should not prevent the pose being free, easy, and natural—and that when they attempt to do more they must beware of artificiality, affectation, and bathos.

London and Provincial Photographic Association.—February 26th, technical meeting; March 3rd, lantern and musical entertainment, with brief interlude consisting of a demonstration of the polarisation of light; March 5th, pictorial composition, illustrated by the lantern; March 12th, lantern night.

* It is curious and amusing that some photographers who have taken up photography comparatively recently seem to know so little of the history of the art that they think, or, perhaps, only assume, that its claims as art is a new idea, and have only been seriously made (with examples ?) in their own time, and by themselves. Even Mr. Davison—who is not usually a jocular writer—in his lecture at the Society of Arts, says of photography: "In regard, however, to its own direct claim to be admitted as a means of artistic expression, it has only happened with the introduction and application of these principles (naturalistic) that any serious demand to be recognised in the domain of art has been made." This apparent ignorance is another example of make-believe, for I credit the writer with more exact knowledge—to say nothing of these same principles having been renounced as unsound by their originator.

## PHOTOGRAPHY IN THE ORDNANCE OFFICE.*

BY COL. SIR CHARLES WILSON, K.C.B., K.C.M.G., F.R.S.

Up to 1853 all Ordnance Survey maps were engraved on copper; but in 1854 lithography was adopted for the $\frac{1}{500}$ and $\frac{1}{2500}$ scales. This was soon displaced by zincography, which has in turn, since 1889, given place to photo-zincography. The art of printing a line photograph in permanent ink from a zinc plate, or photo-zincography, was discovered in 1859: but, excepting for the reproduction of national MS., no practical use was made of the discovery until 1881, when the process superseded engraving for the production of the 6-inch map.

To obtain the full advantages of the process, the MS. $\frac{1}{2500}$ plans were drawn in a style suitable for reduction, *i.e.*, the buildings were coloured yellow to reproduce black, and the names, ornaments, and numerals were exaggerated so that their reduction might be of the proper size. This arrangement had its disadvantages. The $\frac{1}{2500}$, or parent map, still continued to be published by zincography, and was really sacrificed to its offspring, the 6-inch map, which was published months in advance of its parent. It also ruined the drawing which was formerly so much admired, for the draughtsmen, realising that their efforts were only directed to the preparation of a groundwork for a mechanically reduced map, lost interest in their work. In Ireland, however, where photo-zincography has never been introduced, the MS. plans continued to be very beautiful works of art. Photo-zincography has now been adopted for the publication of all new plans on the $\frac{1}{500}$ and $\frac{1}{2500}$ scales, with the following advantages: Fidelity of reproduction of the original; saving of cost in the case of close work; acceleration of publication; uniformity of execution; great improvement in the style of original drawing; and facility in revising town plans. The parent plan has also resumed its proper place in the publication in advance of the 6-inch map.

The photo-zinco process is so well-known that I need not describe it here, except to point out the larger scale upon which photo-copying is being carried out by the Ordnance Survey Department. The glass plates measure 45 by 30 inches, and weigh 33 lbs. The paper used for the photo transfers is Evans' thin paper; and it might be thought that a system of photographic reproduction, based on a flimsy paper transfer, would introduce many elements of inaccuracy. In practice, however, the process is found to compare favourably, as regards accuracy, with zinc etching methods, and engraving on stone or copper. Impressions varying more than one-sixth per cent. from the true scale are now cancelled. This result is very largely due to the skill that has been acquired by the photographic and printing staff.

The following method has recently been adopted for producing the $\frac{1}{2500}$ plans of large towns from the $\frac{1}{500}$ plans:—A convenient number of $\frac{1}{500}$ plans is pinned together, and a negative of the reduction obtained in the usual way. From this negative a cyanotype print is obtained, the result being a pale blue image on a white ground. The necessary drawing is now proceeded with on the cyanotype, and, when complete, it is fixed in its proper position with the surrounding $\frac{1}{2500}$ detail, and then re-photographed for publication.

The maps are now printed by a specially designed steam

* A portion of a paper on "Methods and Processes of the Ordnance Survey," read last Wednesday night at the Society of Arts.

zinc-plate printing machine, which, when necessary, can print 900 impressions an hour.

Until 1881 the 6-inch map was engraved on copper, the reduced detail being obtained from the $\frac{1}{2500}$ map by photography. In 1881 it was decided to abandon engraving in favour of photo-zincography, and the practice was to pin four $\frac{1}{2500}$ sheets together with their proper margin, and reduce them at once to a quarter-sheet.

The present system is to take a blue impression of each $\frac{1}{2500}$ sheet as it is being printed for publication, and, upon this, to pen into scale all detail that is to appear on the 6-inch map in black, whilst the names, ornaments, trees, and numerals are typed in an exaggerated style, so as to be of suitable size when reduced. All parcel and area numbers and unimportant detail are not penned in, and, being in blue, do not photograph. Four such plans, forming a 6-inch quarter-sheet, are placed together, and reduced at once by photography. The parks, mud, and sand are inserted in a tint by transfer from copper after the photo-transfer has been laid down on zinc.

The six-inch quarter-sheet was adopted partly for convenience, the size being much more handy than that of the full sheet, and partly for acceleration of publication, for a quarter-sheet can be published as soon as the four component $\frac{1}{2500}$ plans are received, without waiting for the other twelve.

It may be mentioned that, as an experiment, sixteen $\frac{1}{2500}$ plans were placed in position on a screen with proper margins, and a full six-inch sheet produced from them in one operation. There was a slight distortion towards the corners, but I believe this may eventually be overcome.

## THE PHOTOGRAPHIC SOCIETY.

OF the report of the council of the Photographic Society read at its last meeting, the following portions are of the more general public interest :—

The Exhibition was, on the whole, satisfactory, although there was a diminution in the number of visitors as compared with the corresponding number for 1889.

The following table, giving the results of the analysis of the last six exhibitions, shows the details for comparison :—

| Year. | Frames. | Photographs. | Portraits and Figure Subjects. | Landscape and Architecture. | Miscellaneous. |
|---|---|---|---|---|---|
| 1885 | 673 | 1620 | 482 | 803 | 102 |
| 1886 | 675 | 1494 | 603 | 580 | 36 |
| 1887 | 642 | 1784 | 864 | 549 | 179 |
| 1888 | 518 | 1098 | 442 | 611 | 45 |
| 1889 | 640 | 833 | 388 | 360 | 85 |
| 1890 | 658 | 808 | 381 | 348 | 79 |

| Year. | Professionals. | Amateurs. | Members. | Non-Members. | London. | Country. |
|---|---|---|---|---|---|---|
| 1885 | 103 | 119 | 103 | 119 | 103 | 110 |
| 1886 | 101 | 97 | 105 | 93 | 87 | 101 |
| 1887 | 110 | 102 | 121 | 91 | 100 | 102 |
| 1888 | 75 | 83 | 103 | 55 | 89 | 69 |
| 1889 | 100 | 88 | 102 | 86 | 84 | 104 |
| 1890 | 83 | 80 | 82 | 81 | 79 | 78 |

The following is the analysis of the 1890 Exhibition :—There were 163 exhibitors, comprising 82 members, and 81 non-members. There were 6 foreign exhibitors (America 2, France 1, Germany 2, India 1). The 163 exhibitors comprised 83 professionals and 80 amateurs. 658 frames were hung, containing 808 photographs, of which 328 were portraits, 53 figure subjects, 348 landscapes and architectural subjects, and 79 miscellaneous, including a few animals and marine views.

It is with great pleasure that the council has been able to take the new premises at 50, Great Russell Street, where the meetings are now held. The guarantee fund which was raised last year will probably save the Society from losing any portion of its invested capital through this new departure, and it is hoped that the increased conveniences which the Society now affords will attract a sufficient number of new members to enable the council to prolong the period of three years for which the premises have been taken. It is requested that members will bring this matter to the notice of others who are interested in photography, and that they will endeavour to obtain additional members for the Society.

Efforts to establish a library and a museum are being made, and to obtain copies of all English and important foreign photographic publications which we do not now receive. The reading-room and dark-room are already available daily for the use of members.

Mr. Edwin Cocking has resigned the appointment of assistant secretary, after having served the Society zealously for fifteen years. Mr. H. A. Lawrance, whose wide acquaintance with photography and photographic literature will be of great use in carrying out our new arrangements, has been appointed to the office. The *Journal* has been published as usual. It is believed that the "Abstracts," which have been prepared for it each month by Mr. Lawrance, have been found to be very useful.

The scheme for the establishment of a Photographic Institute has taken more definite form. A paper on the subject was read by Dr. Lindsay Johnson in February last. The ex-Lord Mayor (Sir Henry Isaacs) and several other prominent gentlemen have expressed great interest in the subject. A report has been drawn up showing the general lines on which it seems desirable to work, and a copy of this report has been sent to all metropolitan and provincial photographic societies, with a view to eliciting the opinions of the photographic public on the scheme which has been brought forward. It is hoped that, during the current year, substantial progress may be made.

During the year, a committee was appointed to consider the question of lens standards, and to report on the advisability of introducing other standards (such as for weights, measures, intensity of light, &c.) for use in photography. It was intended to continue the work carried out by the Society in 1881, but not to alter any of the standards then laid down. The committee has made a report so far as the extension of the lens standards of 1881 is concerned, and the amended memorandum of lens standards will be published as soon as possible.

It is regretted that no papers were read during the year on the application of photography to its employment as an art, the meetings of this Society having been devoted to the scientific rather than the artistic side of our subject. The council wish to state that papers devoted to artistic photography will always be welcomed.

As already announced in the *Journal*, the progress medal for this year has been awarded to Lieut.-Col. J. Waterhouse, B.S.C.

The council has elected Dr. Miethe, astronomer at the Potsdam Observatory, Berlin, an honorary member of the Society.

In the third paragraph from the end of the foregoing quotation, on the amendment of Mr. J. W. Swan, a wise alteration was made in the wording of the report where it originally read that the meetings of the Society "*should* be devoted to the scientific rather than to the artistic side of photography," a remark which would mean the voluntary abrogation of a large section of the influence of any society in the photographic world.

The following particulars are from the report of the treasurer, Mr. W. S. Bird :—

I have the pleasure to report that, while our losses by resignation, death, and default amounted to 20, we have enrolled 12 new members, and are dealing with fresh applications. The list of members comprises 5 honorary, 59 life, 369 ordinary, and 13 non-resident, a total of 446, as against 418 in 1889.

As to the Exhibition, I think we must look upon 1889 as marking the highest point of success we are likely to attain. Our last certainly suffered by the lovely St. Martin's summer contemporaneous with the first three weeks of its opening; boating and garden parties were in full swing, and nature, decking herself in autumnal beauty, invited worshippers to her shrine. Secondly, great as was the number of pictures, and marked as was the influence of artistic and impressionist ideas in their production, there was found by many to be a monotony of effort and effect, and a melancholy prevalence of a low key of colour expression. The record shows that members repeated their visits to the Exhibition less frequently than usual. The lantern display was inferior to precedent. If the Society determined to obtain the finest possible collection of slides, representative of triumphant photographic work illustrating nature, science, and art; arrange for capable exponents of the subjects, and limit admission to the number that can be comfortably accommodated, the rooms would, in my opinion, be crowded four nights a week, at such prices for admission (one scale for the public, one for members) as would cover incidental expenses, and beneficially augment revenue.

The museum fund is in existence, and doubtless waiting on the project of a Photographic Institute assuming some definite shape. Possibly, we may presently see the photographic community—amateur, professional, mercantile—loosening purse-strings in that direction, and setting an example to city companies and to a wealthy public: but I doubt if many of us have lively anticipations of so remarkable a demonstration.

If no grand scheme is likely to be started and sustained in influential quarters, it may be possible to affiliate all photographic associations with the parent society, and give it the strength to initiate an institute that may develop with years into proportions adequate to the actual and potential activities of photographic science, and its applications to physical and intellectual needs. We have recently dispatched copies of the report on the need of a Photographic Institute, and the work it should do, to no less than 195 established photographic societies.

If only one hundred of these could be affiliated to the parent society, with an average of fifty members each, upon mutually satisfactory terms, such a combination of numbers, income, and energy could at least do something to lay broad and strong the foundations of an efficient Institute.

I am roving into fields of speculation, and had best come back to my figures, and submit an estimate of ways and means for the current year. In the first place, the cost of establishing ourselves in these rooms, with furniture, fittings, and dark-room appliances, amounts to about £130, and this amount it is necessary to take from capital. Seeing that half of our outlay is on premises held by agreement for three years, a decent sum must be annually written off for depreciation, say, £25 a year, and allowing this and £25 for the unexpected, I estimate our balance sheet for 1891 will come out after this fashion:—

| *Receipts.* | £ | *Payments.* | £ |
|---|---|---|---|
| Entrance Fees and Subscriptions ... ... ... ... | 400 | Rent, Gas, Coal, Assistant-Secretary, General Expenses, No. 52 ... ... ... ... | 305 |
| Exhibition ... ... ... | 370 | Exhibition, with Rent of Pall Mall ... ... ... .. | 470 |
| Advertisements, &c., &c. ... | 10 | *Journal* ... ... ... ... | 145 |
| From guarantee Fund to Balance... ... ... ... | 160 | Depreciation and Unexpected | 50 |
| | £970 | | £970 |

Photographic Club. — February 25th, monthly lantern meeting; March 4th, "Printing on Rough Surface Papers."

Obituary.—The death is recorded, on the 11th inst., at Edingthorpe Rectory, North Walsham, of the Rev. J. Lawson Sisson, aged 75. In the year 1853, the deceased published formulæ for making proto-nitrate of iron and formic acid developers. (See *Journal of the Photographic Society*, vol. i., pages 66 and 151.)

## THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The following is the report of the committee for 1890 of the above Association, to be submitted to the annual general meeting on Friday next, February 27th, at 50, Great Russell Street, London:—

In reviewing the work of the year 1890, and in presenting the balance sheet, it will be desirable to recall the position of the Association at the commencement of the past year. At the annual meeting, and at subsequent adjournments thereof, the new rules were passed, and they have since been duly registered. These rules, it will be remembered, were framed with the object of extending the limit of the Association's usefulness, as it was then felt that the sum of £18 distributed in relief would hardly justify the continued conduct of its affairs on the same lines as hitherto.

It will be seen by the balance sheet that the new scheme has had the effect then anticipated, and we, your committee, can now point with satisfaction to the fact that, after proper enquiry into each case brought before us, we have disbursed in grants and loans nearly seven times the amount thus distributed in 1890. With regard to expenditure, the printing of the new rules and providing collecting boxes and printed boards setting forth the objects of the Association, necessitated an exceptional outlay, which accounts for the large amount put down for printing, &c. The balance carried forward to the present year, in consequence of the large increase in the grants, shows a considerable reduction, being £84 4s. 10d. compared with £125 12s. 11d. brought forward from 1889.

Turning now to the receipts, if we exclude the sum transferred from the abandoned "Orphans' Fund" which exceptionally inflated the receipts for 1889, it will be seen that the donations and subscriptions have exceeded those of the previous year by £11 or £12. It is with much satisfaction that we refer to the amount derived from the annual benefit at the exhibition of the Photographic Society, from the Chester Convention, from the Drapers' Hall Exhibition, and from the entertainment given by the Photographic Club. These are signs of appreciation of the position and work of the Photographers' Benevolent Association, which may well be expected to act as an example and a stimulus to others.

But, while the Association cannot be too grateful for the support given by these societies, and by donors and subscribers, many of whom are old contributors, it is incumbent on us to call attention to the fact that, unless we receive still farther help, it will be impossible to meet the claims for assistance which are now constantly coming before us, and which are likely to increase rather than to diminish. The pension fund, except for accrued interest, still stands as at the commencement of 1889, though we had hoped to be in a position to add to it on the present occasion; but this course is manifestly out of the question while our expenditure so largely exceeds our income.

Now that the Association can show what has been done during the past year, it is hoped that its claims to support will be recognised by many of those who have hitherto held aloof, and we earnestly trust that all photographers, and all who are interested in photography, will consider those claims, and will respond liberally to the appeal we now make for further funds, as it is only by a cordial recognition of our aims, followed by a liberal response to our appeal, that the objects of the Association can be carried out with thorough efficiency.

It is with much regret we record the death of Mr. T. J. Collins, who for many years served the Association as deputy chairman of committee.—Signed, on behalf of the committee,

William Bedford, *Chairman.*

The Photographic Society of Great Britain.—The next technical meeting will be held on Tuesday, 24th inst., at 8 p.m., at 50, Great Russell Street, Bloomsbury, W.C. The subject for discussion will be "The Dark Room and its Fittings." A special lecture will be given by Mr. Leon Warnerke on March 4th, at 8 p.m., on "The Simplified Photo-collographic Process." It is hoped that a collection of English and foreign collotypes will be on exhibition. Anyone interested in the process will be admitted on presentation of visiting card.

## CAPTAIN ABNEY'S LECTURES ON COLOUR.

Last Friday afternoon Captain Abney delivered the first of a set of lectures and demonstrations on "Colour" in the great room of the Society of Arts. The lecture was of a popular kind, the idea being to convey instruction in an attractive form, and on the basis of not assuming previous technical knowledge on the part of the auditory. Captain Abney, in introducing the subject, said that no natural phenomenon gives greater pleasure than that of colour. The scientific mind is not satisfied with merely receiving the pleasure which colour offers to the senses, but requires to investigate the reasons for the appearance of colours of varied kind. Art pays no attention to numbers, but it is the business of science to reduce colours to numbers, to make a statistical description. He thought that one of Turner's pictures might be expressed by science by noting and giving description of the colour and intensity of each part of it.

Colour depending upon light, it is therefore necessary, in the first place, to go somewhat into the science of light itself. It is not possible, even if expedient, in that course to treat the subject of light exhaustively, nevertheless enough must be explained to make clear what had to be said with regard to colour. White light is composite; its components are retarded to a different degree by passing through glass or other media; in other words, these components are differently refracted. No medium being perfectly transparent, even air retarded and absorbed a certain amount of light.

Having explained that the light to be used in the experiments (the electric arc) depended upon the disturbance of the molecules of the carbon points, the lecturer proceeded to give an idea of the minuteness of molecules, and followed this by referring to the rapidity of the vibrations of the luminous rays. To illustrate this point it was mentioned that for certain rays there are as many vibrations in one second as there are seconds in twenty millions of years.

The rate of vibrations of molecules was then discussed, and the absorption of certain rays analogically illustrated by the taking up of certain sounds by strings tuned to vibrate with the same rapidity as that belonging to the sounds thus absorbed.

Colour was described as produced by the deprivation of white light of a portion of its constituents. It would, therefore, be an absurdity to speak of converting white into coloured light. That was an impossibility. When a coloured glass screen or bottle of coloured solution was placed in the path of a ray of white light, what happened was this. The atoms of the glass or of the solution were vibrating at the same rate as that of certain of the rays of light. The vibration of these rays was taken up by the atoms, and consequently did not pass through, whilst the vibrations of the remainder of the light were transmitted and produced the effect of colour.

An apparatus for decomposing and recomposing the elements of light was shown, and its work projected upon the screen. Following this, the subject of fluorescence was taken up, and it was shown how certain rays were absorbed, and the fluorescent substance then gave out rays having other rates of vibration; thus rays from the invisible part of the spectrum might be made to stimulate an action corresponding to and producing visible rays.

Interference was next described, and its effect in producing iridescence in thin films illustrated by the projection of an image from a soap film, a gorgeous display of colour.

Photographers who have the opportunity should find both interest and instruction from attending the present course of lectures, which, as has been mentioned, are upon a popular basis, although not on that account to be confounded with the trivial and often incorrect displays of popularised science which obtained a certain amount of favour many years since.

## OUR PHOTOGRAPHER, MR. BROWN.

BY JAMES MEW.

His name was Brown, and his ways were free,
And he opened his place a week ago;
But he only took of our portraits three,
Then married, and closed his studio.
By each of his customers hangs a tale,
And yet they were of the human kind;
There was not among them a single male—
But I'll tell you their stories, if you're inclined.

First came the parson's wife; with skill
Were her faded charms repaired by art;
Her face—thought Brown—though it makes me ill,
Might certainly make an artistic *carte*.
Ah! Brown has never been pardoned yet
By this lady, rendered by art so fair,
For he wrote on the back of her *cabinet*,
"Original (1) preserved with care."

Next came a widow advanced in years,
A widow as mean as mean could be;
But Brown, he managed to quell her fears
Of the cost, and showed her in poses three.
"How much would you take me for, Sir?" she cried,
As she thought of the charge of his rival, Green;
And Brown, as his guileless smile waxed wide,
Said, "I'd take you, Miss, for about sixteen!"

Last came to his door a maid of grace,
And riches, and beauty, your heart to rive;
Said Brown, as he covered his blushing face,
"Can I be content with her negative?"
"How will you take me?" that maiden smart
Asked. Said bewildered Brown, in verse,
"On the plate of my heart, a permanent *carte*,
For richer or poorer, for better or worse."

The Physical Society.—At the annual meeting of the Physical Society, held last Friday at the Science and Art Department, South Kensington, Professor A. W. Reinold, F.R.S., presided. Professor J. Perry read the annual report, in the course of which it was stated that the Society now has 365 members. Mr. G. M. Whipple, Superintendent of Kew Observatory, proposed a vote of thanks to the Lords of the Committee of Council on Education for the use of the lecture theatre for the meetings of the Society; also for the use of the scientific appliances on the premises for demonstrations. All this saved the Physical Society much expense, and gave it an advantage over the Royal Society in the giving of experimental illustrations. Professor Sylvanus Thompson wished it to be generally known that the publications of the Physical Society are accessible to the public, and can be purchased. A paper by Sir John Conroy was read on "The Influence of Heat on Coloured Media." He heated a piece of cobalt glass, but not to its melting point, by means of a small burner; of the three absorption bands which cobalt glass gives in the spectroscope, the outermost edge of the band in the red shifted a little in the direction of the ultra-red end of the spectrum when the glass became hot. Some farther particulars about facts made known at this meeting will be found in the "Notes" upon another page.

## Notes.

At a meeting of the Physical Society last Friday, Professor Minchin gave a demonstration of the working of his cells, which cells have been already fully described in these pages, for obtaining electrical energy by the agency of light. The "impulsion" cells were so delicate that the motion of the foot of an observer in the laboratory, or the vibrations set up by a passing cab, would frequently throw them into the insensitive state, or *vice versa.* A battery of the steadily working class of cells he connected with a quadrant electrometer, and when light fell upon the battery the needle of the electrometer moved and caused a platinum wire to touch a platinum plate; this completed the circuit of an ordinary local battery, and caused a bell to ring. A suggestion has been made that this principle can be applied to the protection of bankers' safes, so that when anyone enters the strong-room with a light a bell shall give the alarm; burglars cannot readily work in darkness. Professor Minchin stated that he hoped, and was disposed to think, that no chemical action was set up in the sensitive surface by light, but that a transformation of energy took place. He had kept up a deflection of the quadrant electrometer with one of them for a week, and no deterioration seemed to have taken place. Some of the cells had been made for several months, and had not deteriorated. If these sensitive surfaces do not undergo chemical change by the action of light, it is a strong point in favour of the dynamic hypothesis of the invisible photographic image.

Some pretty experiments relating to the phenomena of colour were described last Friday at the meeting of the Physical Society by Dr. J. H. Gladstone, who, it may be remembered, many years ago painted invisible designs upon white paper with sulphate of quinine, which designs came out dark in a photograph of the sheet of paper, because of the fluorescence of the salt. Some of the salts of cobalt are used to form what are called "sympathetic inks," which come out of a pink colour when a sheet of paper written upon with them is held to the fire; the pink colour is due to a change in the state of hydration of the salt. Dr. Gladstone stated on Friday that when such a salt is dissolved in alcohol the solution is pink, but gradually changes to blue when sufficient water is added. A blue solution in a little water changes gradually to pink as more and more alcohol is added.

A correspondent, who wisely omits to put his name thereunto, sends us the following:—"Is it really true that a photographer who has a glass eye, which turns with the other one, occasionally replaces it by a small detective camera? I was told that he used to walk about with the eyelid closed, and when he saw a suitable object with his working eye, he opened the eyelid of the other in a moment, and got the required exposure. But now he has added mechanism to the detective, and is able to have the eyelid open, like other persons, and when he wants to photograph, he just winks *in a particular way*, which sets some interior mechanism a-whirring, whereby, as soon as the eyelid is again open, an internal screen is removed and then replaced; and so the photograph is taken. He can change the detective for the glass eye, or *vice versa*, while he pretends to be sneezing with his handkerchief before his face. It is all too, too dreadful, but he must be ingenious."

Those who are fortunate enough to use the incandescent system of electrical illumination must be aware, to their cost, that the original estimate for their fittings is greatly enhanced by the somewhat frequent failure of the delicate carbon thread which forms the principal feature of the glow lamps. There is a tiresome uncertainty about the life of these lamps which must be taken into account with the general outlay upon the fittings. A particular lamp may last for years, while another close by it, and on the same circuit, may give way after a few hours' incandescence; and, owing to royalties to inventors, a lamp is an expensive item, and the replacement of several before they have yielded a fair amount of service is, to say the least of it, an aggravation hard to be borne.

Hitherto a broken incandescent filament has resembled Humpty-Dumpty in the inability of all the king's mounted men being able to put it together again; but a French inventor, M. Pauthonier, has recently described a method by which reparation may be made, and large users of the pretty fairy lamps will welcome the discovery. The faulty lamp is placed in the hands of a glass-blower, who, by means of the blow-pipe, makes in the bulb a hole sufficiently large to extract the useless film, and to insert a new one. The new filament is attached to the stumps of the old one, and after the bulb has been filled with a liquid hydrocarbon a current of electricity is applied which decomposes the liquid, and makes the joints good by the deposition of solid carbon all round them. The glass is next bleached, to get rid of the dark carbon deposit which is commonly seen in lamps which have been long in use; it is then once more exhausted of air and sealed up. It is now as good as ever it was, and is ready to enter upon a new lease of life.

The toning of lantern slides, by which operation various colours can be produced, is a recently introduced modification of slide manufacture which will be found extremely useful in many branches of work. In lantern slides of microscopic objects, the colour of the original can be closely imitated, while the blue tone which can be obtained after fixation by means of the gold and sulphocyanide bath will give, for certain subjects, the effect of moonlight. All brilliantly illuminated sky and sea pieces, where bright lights sparkle on the waves, are fit subjects for this treatment, while other pictures, where the lights and shadows are in strong contrast, are vastly improved by a blue tone.

The ease with which any colour may be produced on a slide prepared by the carbon process is not recognised as it should be. Workers who have always devoted their attention to other processes have neglected this one, not knowing, perhaps, how easy it is by it to produce beautiful effects. Carbon tissue is now specially prepared for transparencies, and when the worker cannot get the exact tint which he wants, it is not a very difficult matter to prepare it at home. The year before last, some blue (carbon) slides were shown at the Crystal Palace Exhibition, and were rightly awarded a prize by the judges. The process is especially valuable in the reproduction of astronomical subjects. These used to be drawn by hand, but now that the camera is being every day more and more wedded to the telescope, these rough diagrams should disappear in favour of actual photographs of the scenery of the heavens. A good photograph, well shown by a powerful light, would, if prepared in this way, be the most beautiful astronomical picture possible, second to nature herself.

---

Had Meissonnier chosen to adopt the arts of the modern fashionable photographer, there is little doubt he could have doubled his earnings, large as they were. Occasionally Meissonnier condescended to portraits, but, as in the celebrated instance of Mrs. Mackay, the wife of the American Bonanza King, he very rarely pleased. As one of his critics remarks, "He would paint womankind just as they came to him, with nothing extenuated, and with all their wrinkles, and the powder with which they tried to hide them, set down so faithfully that the disgusted sitters thought they were set down in malice. His paintings of painted women, marvels of accuracy in their absolute fidelity, are true types of realistic art." This is not the kind of talent which sitters appreciate. No wonder, therefore, that few examples of his skill in portraiture exist.

---

Meissonnier could never have become a court painter, although Oliver Cromwell would have delighted in his truth. We suppose an example of a court and fashionable painter who is absolutely true to nature is not to be found. The essential quality of a skilful artist of this kind is an elegant mannerism. As was remarked some time ago in the case of the Guelph Exhibition, the faces of the Kneller and Lely period are so much alike that they are untrustworthy as portraits, simply because the artist has adhered to a supposed type of beauty to which all his sitters were anxious to belong. If Sir Peter Lely had been a Meissonnier, how different the Hampton Court beauties would appear! But then had he been a Meissonnier he would never have been chosen to paint them.

---

It is easy to understand the difficulty which is experienced in obtaining papers to be read before photographic societies. So much has been written on every branch of the art that to expect any novelty is almost hopeless. At the same time, societies must live, and it is to be presumed they cannot live without having papers read at the meetings. We fancy that too much stress is laid upon this supposed necessity. Some of the best discussions frequently happen when there is no set subject set before the meeting.

---

The anxiety, however, of those who have the interests of the Photographic Society at heart in regard to the technical meetings can well be appreciated. We fancy that, in the new rooms, these meetings will be much better attended, and will have more vital ty than there used to be in the old quarters. It is, of course, desirable to have a subject to fall back upon when there is nothing before the meeting. It is a fact, nevertheless, that the absence of a paper induces those members who, under no circumstances whatever, would put pen to paper, to bring out orally some interesting point of practice which they otherwise would have kept to themselves, not willingly, but because the necessity for narration has not arisen. One of the objects of these technical meetings, we take it, is to give opportunities to those members who have had plenty of experience, but who dislike to place their experiences on paper. Hence the absence of a paper is not altogether an unmixed evil.

---

Photographers are not alone in their endeavours to make their productions permanent; artists have troubles from the same source. The question, indeed, has come to such importance in Paris that a committee consisting of distinguished painters has been formed to investigate the subject of the value of pigments.

---

The fact that Mr. Alfred Marks has been appointed manager of the Central Bank of London reminds us that Mr. Marks was the secretary for the society for photographing Old London. It has always been somewhat of a mystery why this society ceased to exist. The work it did was extremely valuable, but surely it did not exhaust the material. Is it not possible for some of the London photographic societies to take up the work as a speciality?

---

A photograph was the cause of a rather curious scene at the *Nouveautes* Theatre, Paris, the other evening. The leading actress in the play assumes the character of a young girl who has lost her parents, and who is anxious to find them. To assist her in her quest, she sticks into her enormous *chapeau en eventail* all the portraits of her friends. These portraits had been bought at random at a shop near the theatre. Early in the evening a young Russian, with several friends, entered a *baignoire*, when, to his great disgust, he discovered that one of the portraits sticking in the hat was of himself. He immediately rushed behind the scenes, and had a wordy war with the lady in question, terminating the affair by violently snatching her hat from her head, tearing his photograph off, and marching triumphantly back to his box! Such sensitiveness is indeed rare.

## PHOTOGRAPHY IN AUSTRIA.

### Professor Lainer on Developers.

Some years ago Professor Dr. Eder delivered some interesting lectures at the Vienna Photographic Society. In one of them that excellent scientist, speaking on the future of photography, remarked that the next important improvements were probably to be expected in the discovery of new developers. And, indeed, in a short time followed the hydroxylamine developer, suitable, however, only for developing silver bromide and gelatine papers, especially for enlargements. But after this came the hydroquinone and the eikonogen developers, which to-day have been brought to an incredible degree of perfection. One of the professors at the Governmental Lehr-und Versuchsanstalt, named Alexander Lainer, has now published very far-reaching investigations, which I give here at length (after the *Photographischen Correspondenz*).

Comparative studies of the developers at present known have shown that their final effect is pretty much the same, and that the chief difference is to be sought only in the duration of the development. For instantaneous photographs it is particularly important to possess quick-working developers, in order to register feeble impressions of light, with a sufficient thickness of reduction of silver. For portraits, it is desirable to carry out all chemical operations quickly, and in general one wishes also the dark parts to be rich in detail. To obtain these ends, different materials have been used, but without such a marked success being obtained with any one as to lead to the exclusive introduction of one developer. Two years ago I called attention to the beneficial influence of ferrocyanide of potassium in the pyrogallol developer, and emphasised the fact that its addition is to be recommended particularly for short exposures, and that dense negatives, full of contrasts, can be obtained with it. Captain Himly studied the effect of ferrocyanide of potassium on the hydroquinone developer, and came to the conclusion that the addition of some drops of a 30 per cent. solution of ferrocyanide of potassium is to be recommended in order to obtain more contrast. With it one achieves more than by an addition of potassium bromide, but yet without a restraining of the development such as takes place with the latter.

Lately I have occupied myself much with the hydroquinone developer, with the addition of hydroxide of potassium and sodium hydroxide, instead of carbonates, and after many experiments obtained proportions which reduce very powerfully without the addition of ferrocyanide of potassium. In rapidity it surpasses all other hydroquinone developers.

Recipe I.

*Solution A.*

| | |
|---|---|
| Hydroquinone ... ... | 10 grammes |
| Neutral sulphite of sodium.. | 25 ,, |
| Water ... ... ... | 60 cubic centimetres ($cm.^3$) |

*Solution B.*

| | |
|---|---|
| Caustic potash ... ... | 50 grammes |
| Water ... ... ... | 100 $cm.^3$ |

Mix per cabinet plate—

| | |
|---|---|
| A (Recipe I) ... ... | 60 $cm.^3$ |
| B (Caustic potash) ... | 3 $cm.^3$ |

This developer brought out a sensitomer image in ¼-minute to 21°, the negative quite clear. The image appears after about three seconds. It is not every kind of plate which allows the use of this developer, for in many sorts it produces a grey fog, an observation made by Eder and Lenhard with their potash hydroquinone developer. To the foregoing developer I added about 12 per cent. of ferrocyanide of potassium, and therewith achieved sharpness with those kinds of plates which, without the ferrocyanide of potassium, showed fog; yet the negatives were hard comparatively, the lights very dense. Changes in the proportions of the mixture led to a developer which is unequalled in its action. This developer, in rapidity of effect, surpasses also the French developer "cristallos."

Recipe II.

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... ... | 900 $cm.^3$ |
| Sodium sulphite ... ... ... ... | 40 grammes |
| Ferrocyanide of potassium ... ... | 120 ,, |
| Hydroquinone ... ... ... ... | 10 ,, |

Solution B remains the same, namely, potassic hydrate $1 \div 2$. For use mix per cabinet plate.

| | |
|---|---|
| A (Recipe I) ... ... ... ... | 60 $cm.^3$ |
| B (Caustic potash $1 \div 2$)... ... ... | 6 $cm.^3$ |

The image appears in about three seconds, and the development is finished in thirty to forty-five seconds, but then the fifth batch of sensitometer plates shows a vigour otherwise often exhibited only by the fourth; No. 25 was still recognisable with certainty. The fourth batch was surprisingly vigorous, and the first numbers showed a good density, without being opaque; the gradation was excellent. This developer distinguished itself by permitting the exposure to be shortened, by yielding details excellently clear in the shadows, and by allowing very rapid development. Of course plates considerably over-exposed must not be treated with any rapid developer. If one adds a larger quantity of caustic potash, the density of the negatives is diminished by the same length of exposure. A diminution of the hydroquinone, and an increase of the sodium sulphite, have a similar effect, which exactly determines the manner in which the ingredients act.

A good recipe is that of using less ferrocyanide of potassium, and substituting sodium hydrate for caustic potash.

Recipe III.

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... | 950 $c.m.^3$ |
| Sodium sulphite ... ... ... | 30 grammes |
| Ferrocyanide of potassium ... ... | 90 ,, |
| Hydroquinone ... ... ... | 10 ,, |

*Solution B.*

| | |
|---|---|
| Sodium hydrate ... ... ... | 30 grammes |
| Water ... ... ... ... | 90 $c.m.^3$ |

If one mixes 60 $cm.^3$ A and 6 $cm.^3$ B (caustic potash $1 \div 2$), one obtains similar results as with Recipe 2; but if one mixes—

| | |
|---|---|
| A. (Recipe III) ... ... ... | 60 $c.m.^3$ |
| (1.) Natrium hydric. depur. | |
| B'. (Caustic soda $1 \div 3$) ... ... | 12 $c.m.^3$ |

one has a modification of the rapid hydroquinone developer, which gives the negatives a softer character, and has a beautiful effect with many sorts of plates, while it produces quite clear negatives.

Both Recipe II. and Recipe III. give quite rapid developers, which, perhaps, bring out portraits too quickly for some practitioners. In that case I recommend Recipe IV., which admits of a somewhat slower, though still quite rapid development.

Recipe IV.

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... | 1,000 c.m.$^3$ |
| Sodium sulphite ... ... ... | 35 grammes |
| Ferrocyanide of potassium ... ... | 25 ,, |
| Hydroquinone ... ... ... | 10 ,, |
| (1.) Natrium hydric. depur. | |

Mix per cabinet plate—

| | |
|---|---|
| A ... ... ... ... ... | 60 c.m.$^3$ |
| B (caustic soda $1 \div 2$) ... ... | 6-9 c.m.$^3$ |

or

| | |
|---|---|
| A ... ... ... .. ... | 60 c.m.$^3$ |
| B$^1$ (caustic soda $1 \div 3$) ... ... | 10-12 c.m.$^3$ |

The image does not appear for about five seconds, and is fully developed in one to two minutes. The gradation is very good; the plate remains clear in the developer, and portraits, even though taken on dull, misty days, produce excellent results. As compared with the pyro-soda plates, they were excellent.

All these developers are convenient to handle. In the morning one may mix a sufficient quantity for the whole day, or for several days. As far as my experience goes, the mixture keeps well in *closed bottles*, and I could not notice any decomposition after eight days. If, however, one wished to produce the mixture in equal quantities immediately before use, it would be easy to calculate it out, *e.g.*, Recipe IV. into Recipe V.—

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... ... | 550 cm.$^3$ |
| Sodium sulphite ... ... ... | 35 grammes |
| Ferrocyanide of potassium ... ... | 25 ,, |
| Hydroquinone... ... ... ... | 10 ,, |

*Solution B.*

| | |
|---|---|
| Water ... ... ... ... ... | 550 cm.$^3$ |
| Caustic potash... ... ... ... | 50 grammes |

or—

*Solution B$^1$.*

| | |
|---|---|
| Water ... ... ... ... ... | 550 cm.$^3$ |
| Sodium hydrate ... ... ... | 60 grammes |

Mix per cabinet plate—

| | |
|---|---|
| A (Recipe V.) ... ... ... ... | 30 cm.$^3$ |
| B or B$^1$ ... ... ... ... | 30 cm.$^3$ |

When travelling, it is advisable to keep a supply of the developer concentrated.

*Recipe for a Concentrated Rapid Hydroquinone Developer.*—A. Dissolve 25 to 30 grammes of sodium sulphite in 100 c.m.$^3$ of water and 10 grammes of hydroquinone warm; then 25 grammes of ferrocyanide of potassium likewise in 100 c.m.$^3$ of water. The two solutions are mixed, and produce 200 c.m.$^3$

B.—Dissolve 50 grammes caustic potash in 100 c.m.$^3$ of water, or 30 grammes of caustic soda in 90 c.m.$^3$ of water.

For a cabinet plate mix—

| | |
|---|---|
| A ... ... ... ... ... | 10 cm.$^3$ |
| Water ... ... ... ... ... | 40 cm.$^3$ |
| B (caustic soda $1 \div 2$) ... ... | 6 to 8 cm.$^3$ |

or—

| | |
|---|---|
| A ... ... ... ... ... | 10 cm.$^3$ |
| Water ... ... ... ... ... | 40 cm.$^3$ |
| Caustic soda $\div 3$ ... ... ... | 10 cm. |

If one mixes the 200 c.m.$^3$ of solution A with 100 c.m.$^3$ of B, one obtains a *mixed concentrated rapid developer*, which must be thinned for use—10 c.m.$^3$ to every 30 c.m.$^3$ of water for rapid developments. Thus, the concentrated solution of 300 c.m.$^3$ suffices for 1,200 c.m.$^3$ of the finished developer, but which may again be diluted with 1,000 c.m.$^3$ of water for slower developments, and with 10 grammes of hydroquinone one gets more than two litres of ordinary developer.

Solutions A could also be used in conjunction with potash or soda, and then one has ordinary, but very good, potash or soda developer, *e.g.*:—

*Soda Developer.*

| | |
|---|---|
| A (Recipe IV.) ... ... ... ... | 30 cm.$^3$ |
| Solution of soda ($1 \div 5$) ... ... ... | 30 cm.$^3$ |

Rapidly acting developer may be made also with potash hydroquinone, of which another time. The potash developer requires a developing of about five minutes, the soda developer of four to five minutes. All developers with sodium hydrate and caustic potash hydrokinone *may be diluted with an equal volume of water*; the development is restrained thereby, but the details do not suffer.

*Bromide of Potassium* ($1 \div 10$).—Ten drops to the quantity mentioned have a powerfully restraining effect, by which chiefly the details of the shadows suffer. It is quite different with *iodine and iodide of potassium*, the effect of which I have fully described. Antichlor acts restrainingly on the hydroquinone developer, but it is not to be recommended for that purpose.

The developed plates must be well rinsed, and fixed in an *acid fixing bath*. One must take care that the fixing bath produces an acid reaction, which may easily be achieved by an occasional slight addition of an acid solution of sulphite.* The fixing bath should be frequently renewed, because an accumulation of solution of sulphite would finally restrain the fixing. For fixing with the acid fixing bath, cuvettes are much to be preferred to trays. The fixing will proceed much quicker, particularly if the plate-carrier is moved up and down with the plate several times.

Now that with these developers the developing proceeds with a rapidity which hardly leaves anything to be desired, it would be well to artificially accelerate the fixing, which might certainly be accomplished by means of indifferent additions to the emulsion.

If one develops a large number of plates with the rapid developer, it is desirable to have at hand a vessel of water containing a few drops of sulphuric acid. When the fingers become slippery, one dips them into this acidified water, by which means the feeling is immediately removed. The developing trays after use should be rinsed first with the weakly acidified water, and then with spring water.

Photography and Painting.

I must add a postscript to my last letter.

In Germany, and formerly in Austria, photographs were considered as mere manufactured articles, but later, in Germany, somewhat better protection was afforded them by a new law. Nevertheless, copyright for life, or for a certain number of heirs, was by no means granted for them. In Austria, repeated judgments of the Supreme Court of Justice decided that photography is to be reckoned among the fine arts, and to be protected against unauthorised reproduction; but, for a long time, painters looked down on it, and would not recognise its co-ordination. The International Photographic Exhibition, planned by the Club of Amateur Photographers in Vienna, will be the first occasion on which a jury meets clearly recognising the co-ordination of photography, and, at the same time, containing men like Professor

* 1,000 cm.$^3$ of water, 300 g. of sodium sulphite, 70 cm.$^3$ of concentrated hydrochloric acid, or mercantile acid solution of sulphite.

Angeli, from whose brush there exists a portrait of Queen Victoria, which, on the occasion of her jubilee, was reproduced in colours by the *Illustrated London News*. In the brotherly co-operation of painters and photographers there lies a great success, for the latter have long considered themselves artists, for which the public often laughed at them. But now a photographic exhibition is to be judged of from an *artistic* standpoint, and that must be considered mighty progress, for this jury would have every right to judge of an exhibition of paintings. Hitherto this new International Exhibition has found the greatest support in England. There, where formerly water-colour painting was more cultivated than on the continent, photography found a public trained to appreciate figure and landscape pieces; therefore the hopes that were connected with your countrymen's taking part in this exhibition were not without justification; but even though, unfortunately, they refrained from doing so, that would not diminish *the fundamental importance* of this praiseworthy undertaking. STYX.



## ASTRONOMICAL TETESCOPES.*

BY A. A. COMMON, F.R.S., TREASURER TO THE ROYAL ASTRONOMICAL SOCIETY.

### NOTE ON A METHOD OF SILVERING GLASS MIRRORS.

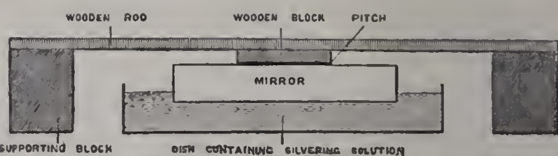
*Solutions.*—Make up 10 per cent. solutions of pure re-crystallised nitrate of silver, pure caustic potash, and loaf sugar. To the sugar solution add ½ per cent. of pure nitric acid and 10 per cent. of alcohol. The sugar solution is very much improved by keeping, its action being more rapid and the film cleaner when the sugar solution has been made for a long time. Make up also a weak solution—say 1 per cent.—of nitrate of silver and a 10 per cent. ammonia (90 per cent. distilled water, 10 per cent. ammonia, ·880 specific gravity). *Distilled water* must be used for all the solutions.

*Cleaning the Mirror.*—Thoroughly clean the mirror. To do this pour on a strong solution of caustic potash, rub well with cotton wool, rinse with ordinary water, wash again with absolute alcohol, and rinse; finally pour on strong nitric acid, and rub with a piece of cotton wool, inserted in the open end of a test tube. Rinse again thoroughly with ordinary water, and then place the mirror face downwards in distilled water in a dish sufficiently large to leave two inches margin round the edge of the mirror, and to keep the face of the mirror one inch from the bottom of the dish. The liquid should stand half an inch above the face of the mirror, which should not be completely submerged, and care should be taken to exclude all air-bubbles.

*For Silvering a 12-inch Mirror.*—Take 400 c.c. of the nitrate of silver solution, and add strong ammonia until the brown precipitate first formed is nearly dissolved; then use the diluted ammonia until the solution is just clear. Then add 200 c.c. of the caustic potash solution. A brown precipitate is again formed, which must be dissolved in ammonia exactly as before, the ammonia being added until the liquid is just clear. Now add the 1 per cent. solution of silver nitrate until the liquid becomes a light brown colour, about equal in density of colour to sherry. This colour is important, and can only be properly obtained by adding the weak solution. Dilute the liquids to 1500 c.c. with distilled water. All being ready, add 200 c.c. of the sugar solution to 500 c.c. of water. Then lift the mirror out of the dish, taking care to keep its face downwards during the time it is out of the water, pour the washing water away, add the sugar solution to the silver potash solution, taking care they are thoroughly mixed, and pour them into the dish. Place the mirror face downwards in this solution, taking care to exclude all air-bubbles. The liquid will turn light brown, dark brown, and finally black. In four or five minutes, often sooner, a thin film of silver will commence to form on the mirror, and this will thicken until in about twenty minutes the whole liquid has acquired a yellowish brown colour, with a thin film of metallic silver floating on the surface. Lift the mirror out, thoroughly wash with distilled water, and stand the mirror on its edge, or rest it in an inclined position until it is dry; if time can be allowed, the silvered mirror may be left to soak in distilled water, over night. Leave it to dry until next day, then the slight yellowish "bloom" can be polished off by rubbing softly with a pad of chamois leather and cotton wool. Carefully polish afterwards with a little dry, well-washed rouge on the leather pad. The film should be opaque and brilliant, and with careful handling will be very little changed with long use.

*Dishes.*—Use porcelain, glass, or earthenware dishes whenever possible; but, if these are not available, a zinc dish, coated inside with paraffin or best beeswax.

For small mirrors (up to 12 inches) the easiest method of supporting them during silvering is to attach them to a wooden rod by pitch, and arrange the dish thus—




*Temperature and Time.*—Half an hour is the usual time taken in silvering, but this is shortened by using warmer liquids. About 65° F. is best for silvering. In colder weather longer time must be allowed for the film to be deposited. In very hot weather a smaller quantity of sugar can be used, say 150 c.c. For a 12-inch mirror it is a safe rule to allow four times the time required to get the first indications all over the mirror as the total time for the mirror to be in the bath.

In cases when it is necessary to silver face upwards, a band may be put round the mirror, and the solutions poured on. It is necessary, in this case, to *leave out the potash solution*, and allow a longer time for the silver to deposit; as much as two hours being sometimes necessary.

If a very thick film is required, two silvering baths can be used, the mirror being left in the first for fifteen minutes, then lifted out, rinsed with distilled water, and at once immersed in the second bath, which should be ready in a second dish. The film must not be allowed to dry during the operation of changing from one bath to the other.

* Concluded from page 91.

THE NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—Lantern evening, February 23rd, "A Day at the Zoo.," by Lewis Medland.

## EASTMAN'S PHOTOGRAPHIC MATERIALS COMPANY.

The *Financial Times* of last Wednesday contains a long report of the first annual general meeting of the above Company, held at Winchester House, Old Broad Street, London, under the presidency of the chairman of the Company, Col. James T. Griffin, from which report we condense the following particulars.

The Chairman said that, about 1884, the Eastman's patents were taken up by a company on the other side of the Atlantic, and shortly they were found to be a great practical success. Towards the close of the year 1885 an agency was opened on this side of the water. The business on both sides continued to increase so, that it was found impossible for the company in America to supply the demands made upon it in Europe. The result was that, in 1889, a company was organised in England, and the shares were immediately subscribed for. The report dealt with the success attending the efforts of the first thirteen months. The demand in America has so increased that they have found it very difficult to keep pace with European requirements, and the English directors proceeded to make arrangements here for the erection of suitable buildings, and the supply of machinery necessary. They bought ten acres of freehold ground near Harrow, and buildings were erected which are now practically completed. The plans were all provided by Mr. Eastman, who has been over here, and who will soon be here again; but it will be some months yet before the Company will be in complete occupation, and ready to manufacture its own articles. What is called the bromide building, in which the printing will be done, will soon be in a position to meet the demands, which are growing month by month in Europe. In the first fifteen months after the agency was established on this side the sales amounted to £7,595; for the next twelve months, £12,900; for the succeeding twelve months, £15,807; for the next twelve months, ending Aug. 31st, 1889, the sales amounted to £26,576. Then the present Company was organised to take possession of the premises. The result is that, for the thirteen months ending Dec. 31st, 1890, the sales have reached the sum of £50,387. As stated in the report, frequently the Company has been obliged to decline orders, as it has been impossible to get the goods to fulfil the orders. Any questions that friends might desire to ask in connection with the report and balance sheet, he would answer to the best of his ability. Some friends might consider that the expenses are rather large. Under the heading of "trading expenses," they would find the sum of £10,775 3s. 10d.; but during the year they had been opening a good deal of new territory. Money had been expended in establishing agencies in different parts of Europe, and they were receiving very satisfactory reports from those agencies. These expenses will not be repeated, or not repeated to the same extent, or, if repeated, will be spread over a much larger return than they had received during the past year. The directors were pleased to be able to recommend a dividend of ten per cent. on the preference shares and five per cent. on the ordinary shares, and to carry forward to the next account £1,635 15s. 11d. He concluded by moving the adoption of the report and balance sheet.

Mr. Spiller had very great pleasure in seconding the chairman's motion.

Mr. Jay congratulated the board on the success they had attained on the year's working. The chairman had mentioned Mr. Eastman's name frequently, but he (the speaker) noticed that in the list of directors there was no mention made of Mr. Eastman.

The Chairman would ask the shareholders to alter that at that meeting.

Mr. Jay, continuing, said that they had already expended £1,400 in the purchase of freehold land. Was there anything more to be paid on the land.

The Chairman: No.

A shareholder remarked that the directors were very much to be congratulated upon the result of the first year's working, and it was a great exception that such a report and statement of accounts should be presented to a meeting of a company only in existence for a year. He thought they all must be satisfied—exceedingly satisfied—with what the directors had done.

Another shareholder: Are the dividends to be paid yearly or half-yearly? I might suggest that the time when the dividend warrants are sent out might be printed on the report.

The Chairman, in reply to the last speaker, read from the articles of the Association an article to the effect that it was optional with the directors whether they should pay yearly or half-yearly dividends.

A shareholder said that he had noticed that they had written off nothing for depreciation of the patents.

The Chairman replied that, under the advice of their auditors and solicitors, and by their own good judgment, they felt that the patents were as valuable, or, in fact, more valuable, than when they took them over. Most of them, he reminded the shareholders, were recent patents, and some of them had only been attained last year, and had scarcely yet been developed sufficiently for use. Therefore, they did not feel justified at the present moment in writing off anything under that head for depreciation.

A shareholder: Is there likely to be soon another call upon the preference shares?

The Chairman: At the present moment we are in no want of money, and from what we can see it is not likely we shall make another call.

The Chairman then put the motion for the adoption of the report, and it was carried unanimously.

Mr. Jay moved the re-election of all the directors, and said that the fact of all the directors retiring proved that the board was not afraid of the shareholders.

The motion was carried.

Mr. Eastman was elected a director of the Company, and the proceedings terminated.

## Patent Intelligence.

### Applications for Letters Patent.

1,856. W. J. Archer, F. W. Archer, and C. W. Huson, 43, Lord Street, Liverpool, "Lantern Slide Changer."—February 2nd.

1,933. C. R. Beaumont, 2, Whitehall Street, Rochdale, "Magazine Camera."—February 3rd.

1,953. R. J. Wynkoop and J. M. Kemp, 18, Buckingham Street, London, "Apparatus for Photo Contact Printing, a Method of Preserving Sensitised Paper, and a Protective and Adhesive Solution therefor."—February 3rd.

2,031. A. Brooker, 52a, Robertson Street, Hastings, "Universal Cameras."—February 4th.

2,042. G. R. Miller, 18, Buckingham Street, London, "Receptacle for Developing."—February 4th.

2,165. G. F. Lutticke, 23, Lansdowne Place, Brighton, "Lantern Slides."—February 5th.

2,190. J. Watson and G. J. Johnston, 34, Grainger Street, Newcastle, "Automatic Plate or Film Changer."—February 6th.

2,211. W. G. Burrows, Boston Road, Hanwell, "Transferring Woodburytype Prints."—February 6th.

2,233. J. Collier, 37, Chancery Lane, London, "Cameras."—February 6th.

2,248. F. W. Verel and W. Hampton, 87, St. Vincent Street, Glasgow, "Preparing, Developing, and Fixing Films."—February 7th.

2,279. T. Miller, St. Mary's Gate, Manchester, "Cameras."—February 7th.

2,390. F. C. D. Beacham, 29, Titchfield Street, London, "Spotting and Retouching."—February 10th.

2,466. J. W. Smith and J. Watson, 10, Otterburn Terrace, Newcastle, "Photographic Shutters."—February 11th.

2,491. Marion and Co. (L. Marion, G Bishop, F. Bishop, J. P. Kirk, and H. Guibout), 22, Soho Square, London, "The

Storing and Repeating the Discharge of Magnesium Powder through a Gas, Oil, or Spirit Lamp, for use in Flash-Light Photography."—February 11th.

2,616. A. J. Buncher, 6, Livery Street, Birmingham, "Cameras."—February 13th.

2,632. M. A. Wier, 115, Cannon Street, London, "Cameras." —February 13th.

2,675. W Rockliffe, 35, South Street, Durham, "Registering Apparatus for Magic Lanterns."—February 14th.

2,725. W. Sanders, 6, Lord Street, Liverpool, "Cameras."—February 14th.

### Specifications Published.

905. *January 17th*, 1890.—"An Improved Lens for Deflecting Light." Theophilus Coad, 31, Soho Square, London, Electrician.

The lens is made of the best glass or crystal, the base being preferably slightly convex, and the front of a parabolic form cut with a number of straight running facets from base to apex; the facets being preferably twelve in number.

A lens as above is primarily intended to be used with miners' incandescent electric safety lamps.

1,394. *Jan. 27th*, 1890.—"A Levelling Instrument." George James Heaton, 2, Coburg Villas, Albert Road, Old Windsor, Berks, Photographic Artist.

The object of this invention is to produce a levelling instrument which shall show at a glance whether or no the surface to which it is applied is level in every direction, such instrument being specially suitable for testing the verticality of the "swing-back" in photographic cameras, the said instrument being attached to the camera or otherwise. According to this invention I take a metal pillar, preferably square in section, having each face thereof accurately perpendicular to the adjacent faces, and its ends accurately parallel to each other and at right-angles to the sides of the pillar.

I next bore a hole longitudinally through the centre of the pillar, which hole is of two different diameters. In the lower fourth part or thereabouts of the length of the pillar the hole is about one-eighth of an inch in diameter, and the remaining three-fourths of the length of the pillar has the hole through it about three-eighths of an inch diameter.

In the larger hole I insert a piece of glass tubing, in the centre of which is suspended by a few fibres of silk, or other suitable material, a small rod preferably of metal, and about one-eighth in diameter, having the lower end thereof cut off at right-angles to the length of the rod.

I also firmly fix in the smaller hole, concentric with the glass tube, a similar rod cut off at right-angles to the length thereof, the upper face of which is just clear of the lower face of the suspended rod.

The metal pillar is cut away, except just at the corners, for about three-quarters of an inch, so as to form sight-holes, the contiguous faces of the two rods coming in the centre of the "sight." On setting the instrument on a flat surface, if the surface is level the two rods will appear as one; but if the surface is not level the upper rod will project beyond the lower one on that side of the surface which is below the horizontal. Similarly, if the instrument is held vertically against an upright surface, say the focussing screen of a camera, the position of the rods will indicate if the surface against which it is placed is vertical.

1,736. *February 1st*, 1890.—"System of Glazing." William John Hall, 16, New Market Place, Saint Helen's, Lancaster, Architect, and George Charles Whitfield, 1, Hardshaw Street, Saint Helen's, Manufacturer's Agent.

This patent is for constructing the frames of windows, especially shop fronts, as that the same shall in all cases be fixed with the rabbeted side outwards, in order to enable the glass to be glazed from the outside, either in the ordinary way, or be bedded in the rabbet with india-rubber, felt cloth, or other soft material, secured with beads or mouldings screwed, clamped, or otherwise fastened in such manner as to be easily removable either for new glazing or replacement.

3,446. *March 4th*, 1890.—"A Photographic Camera." Albert Peter Riley, 2, Upper Fenton Street, Commercial Road East, London, Photographic Material Dealer.

This camera is especially intended for use when travelling, but is also of general application and for indoor work. An important feature of my invention is that I employ only one moving part, which is actuated by the one hand only of the operator so as to move the dry plate into position, or focus of the lens, and so as to uncap and cap the latter for exposure of the dry plate. In the camera, or box, I provide an endless band of leather, sheet metal, or other suitable material, such band passing over a roller at each end, that is to say, at the back and towards the front of the camera. Means may be provided for keeping the band sufficiently taut, or to keep it from slipping. On this band I fix at equal distances apart any suitable number (say a dozen) of holders or clips. Each clip or holder is adapted to take a metal sheath, which contains a dry plate. The same lever, handle, push rod, knob, or pull serves to actuate both the endless band and to cap and uncap the lens.

By means of the apparatus instantaneous and time exposures may be effected conveniently by the use of one hand only rapidly in succession, and while the apparatus is carried under the arm in the bag, and without drawing undue attention to the operations.

17,012. *October 24th*, 1890.—"An Application of Xylonite, Celluloid, and the like." George Lee Auders and Charles Herbert Elliott, 10, Bush Lane, London, Electrical Mechanicians.

Our invention relates to a new or improved use for and application of any of the preparations known as xylonite, celluloid, and the like, by coating the surfaces of substances bearing devices or readable matter therewith.

In carrying our invention into effect, we print, emboss, indent, or otherwise prepare a fixed design or reading matter, or both, upon cardboard, paper, wood, ivory, metal, or any substance or material suitable for the purpose, in any colour or combination of colours, as may be required, and coat or cover the same upon either or both sides thereof with xylonite, celluloid, or the like, according to the uses to which the substance or material so treated may be intended. The coating thus given, being perfectly transparent and highly glazed, imparts to the design a high degree of finish, and, at the same time, renders it perfectly water-proof.

Our invention, in its salient points, is the application of the coating or covering previously mentioned to substances and materials bearing designs or readable matter that would be considered perishable or oxidisable when exposed to damp, or to advertisements that may require to be kept clean by washing, such as show cards and the like, prepared upon paper surfaces; or metallic advertisements that require periodical cleaning to remove oxidisation.

Our invention may be equally well applied to substances or articles not exposed to damp, and may be successfully used in coating business cards and the like, so that, if soiled, they may be sponged with clean water, and their original brightness restored.

20,820. *December 20th*, 1890.—"Applying Gum or other Liquid to Sheets of Paper." Hermann Wimmel and August Landgraf, Zimmerstrasse, Hamburg, Germany, Machine Manufacturers.

This invention relates to machines for applying gum or other liquid for the superficial coating of sheets of paper or other material placed upon the machines. The sheets are transferred from an adjusting table to a grasping device which is arranged on the circumference of a metal cylinder. After the locking of this device, which grasps the edge of the sheet, the cylinder begins to rotate, and carries along the sheet on its periphery. Underneath said metal cylinder is a small roller journalled in the frame of the machine, which roller lies with part of its periphery immersed in a vessel which contains the solution of gum or other liquid to be applied.

Whilst the sheet travels between the cylinder and the roller the latter transfers the gum or liquid to the surface of the sheet. The coated sheet, after the completion of a rotation of the cylinder, and after the grasping device has opened agaiu, is removed from the machine, aud a new sheet is iuserted under the fingers of this grasping device when the rotation of the cylinder is repeated.

## Correspondence.

### REDUCED RAILWAY FARES FOR PHOTOGRAPHERS.

Sir,—I beg to enclose you a copy of a memorial and letter sent this week to all the London aud suburban photographic societies. All interested iu the cause will, I am sure, feel deeply grateful for the co-operation and support of your valuable paper, and for any reference to the memorial in its columns that you may deem it advisable to make. Henry Selby,

*Hon. Sec. of the West London Photographic Society.*

42, *Ladbroke Grove Road, London, W., Feb. 14th.*

Dear Sir,—At a meeting of the West London Photographic Society, held at the Lecture Hall, Hammersmith, on the 23rd January, 1891, the president, Mr. Walter Adam Brown, in the chair, it was resolved: "That the question of cheap fares for members of photographic societies having been discussed for some time, the period has now arrived to bring the matter before the railway authorities, and that the memorial in favour of the scheme in the form presented to-night by the president be forwarded to all the metropolitan photographic societies for their approval, and on its return be at once lodged with the railways in question."

In pursuance of such resolution, I beg to enclose you print of the memorial, aud I should be glad if you will kindly lay it before your society at its next meeting, aud return it to me filled up as early as possible, with an intimation whether or not I may add the name of your society as one of the memorialists. Henry Selby,

*Hon. Sec. of the West London Photographic Society.*

42, *Ladbroke Grove Road, London, W., Feb. 9th.*

To the Chairmen and Boards of Directors of The Great Western, The Great Northern, The London and North Western, The Midland, The North London, The London and South Western, The Great Eastern, The South Eastern, The London, Chatham, and Dover, The London, Brighton, and South Coast Railways, and the other London and Suburban Railways.

My Lords and Gentlemen,—The humble petition of the under-signed London and suburban photographic societies and clubs showeth as follows:—

1. That the practice of photography is daily increasing, and that large numbers of those practising it do so, not as their sole occupation, but as an amusement, or in counection with other duties and occupations.

2. That a considerable number of photographers have joined societies established for the instruction and furtherauce of the art of photography, and those societies are governed by responsible boards of management.

3. That the greatest number of effective subjects suitable for photographs consist of landscapes and seascapes, and interesting spots some distauce from London, but the costs of the travelling expenses to those places is a serious drawback, and a reduction in the prices of tickets to your memorialists would be a great boon to them.

4. That concessions have been made by railway companies in favour of members of angling and other clubs, whereby any member of a duly accredited angling club can have issued to him a railway ticket at greatly reduced fares, on presenting his ticket of membership, and declaring that he is actually then goiug on a fishing excursion. Your memorialists ask that the same privilege may be accorded to them, and they further ask that as photographers cannot always go in a body to the same place at the same time, that any member of the memorialising societies may be entitled to the cheap ticket without the necessity of making one of a party.

5. Your memorialists submit that subjects taken of the route of auy line of railway fosters traffic on that line, and that the directors think so also is demonstrated by the fact that on many lines excellent photographs of places are exhibited in the railway carriages themselves. These are only seeu by actual passengers, whereas photographs taken by your memorialists would be carried into other hands, who otherwise might uot have known of such places at all.

6. Your memorialists are not unreasonable, and they think that some concession would lead not only to a large increase in the traffic, but to an increase in the profits of the railways themselves, and, at the very worst, it could easily be cancelled by a further order of the railways if found not to answer.

7. That your memorialists consist of the following societies, who have, by resolutions, approved of the memorial, and who would be happy to give further informatiou if necessary.

[Here follow the names of each society, its address, the name and address of the secretary, and the number of members on the books.]

### THE QUAGGA.

Sir,—I sent you a hurried note some little time ago *re* your remarks Mr. York and the last quagga. The holidays intervening, I have been unable to redeem my promise. The specimen copy of the quagga in the Year-Book is (I am almost convinced) one of my many negatives taken at the Zoo. It is now eighteen years ago, and it would be difficult to remember all the negatives taken. Mr. York considered I was singularly successful—at least I understood him to say as much. It was a kind of test of my ability previous to sending me out to this country. I give you a description of my iustrument and manipulations as far as I cau remember. I have many times since seen lantern slides from the same negative, and have had every reason to be satisfied with my work.

The apparatus was built by Meagher—a double camera, lenses placed so, ₒ°ₒ; the camera divided in half; the top part was provided with a Burr leus; the two bottom lenses, acting as stereo leuses, were Dallmeyer's 2B lenses, all identical in foci, diameter, &c. The equal of the lenses I have not seen either before or since. The top lens was used only as a finder; the shutter was immediately iu front of the plate, being slipped in position from underneath the camera, and was simply a blind lath of wood pulled down on to a spring, which sent it up when released. The plates were 8in. square, double stereo. The back was shifted after the first exposure. The slides were very solid, and had a roller shutter, the first, I believe, used in Great Britain, and were perfect in every respect. I invariably used the full aperture of the 2B's or the next stop to it. The average exposure, if I remember rightly, was about a second. All I had to do was, after getting into a suitable position, to sight the beast on the finder focussing glass, my head being under the focussing cloth, aud, with string in hand, pull down the shutter when I got a satisfactory position. I must confess I did not fiud much difficulty with my subjects; my left hand being on the rack screw, I could alter the focus or swing round as required. The collodion was what was then known as York's, rather uew. The developer was made from a saturated solution of ferri-sulph. with acetic acid, afterwards dissolved off with cyauide of potassium.

Perhaps my success was in a great measure due to a careful study of the animals. They, like ourselves, sulk at times, and you cau do nothing with them. Then there are ways of getting the fire iuto their eyes. I have barked at the carnivora, whistled to the reptilia, grunted at the antelopes, until I had a throat like a nutmeg grater. By the time I had finished in the Zoo, I knew the official name and habitat of every living thing in the place. I had several narrow escapes, as you may imagine. One especially I may refer to. I was photographing the two-horued rhinoceros; I was inside the paddock, to get rid of the bars; the keeper was with me with his whip. The beast was up against the palings, and the crowd outside were feeling his hide with their sticks and umbrellas. Whether they touched him in a tender part, or that he had some evil desigu on me wheu I was covered with the focussing cloth, I know not, but he charged me. The keeper shouted, and, in an instant I laid hold of the camera (a very heavy one) by the handle and ran into his den, and just got through the wide wooden bars when he came with a rush. I got through safely with the camera, after doing about the fastest on record. It knocked all the wind and zoology clean out of me for a time. This was one of many scenes. It was impossible, with the limited means at my command (I mean, as compared with the present time) to get rid of the bars in all cases; still, when I could do so I did, even at great risk. Then and now are two different things, and I am sure there ought to be no trouble whatever in securing every pose and position. The many hours required or wasted by Mr. Bolton in securing the lion I cannot understand. Some people make much of their exceptional studies, the time and money it has cost them, &c. What is necessary is to recognise in an instant what is required of you, and to be prepared to do it at once. I find that in my every-day work. I have had several assistants from England, and they all lack this essential quality. A man with a knowledge of the arts and sciences, as applied to every-day life, will invariably hit the thing straight off the reel. It is not given to everyone to "grasp the situation," as Gilbert says in "The Gondoliers;" still, those who will study the thing will find a very profitable employment—I mean to know what to do "when the unexpected happens," so that it will come out trumps.

*Re the Quagga.*—They are not extinct in this country. Down colony, near Sand Flats, is a place called Quagga Flats. I believe they run there still. Does the quagga breed? I am under the impression that the beast is the result of Birchell's zebra mixing with the donkeys on the different farms. I have often seen hundreds of thousands of spring bucks mix with farm flocks. All wild animals mix with the flocks when they are migrating.

The curses of the Pharoahs are still with us. Last week the sky was darkened with locusts, frightful and hideous, eating every living thing. They actually stopped the train. We have still the old plagues of frogs, locusts, murrain of beasts; well, yes, and Potiphars' wives, too, in galore. B. Harvey.

*The Kimberley Photographic Studio, South Africa.*

## GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

Sir,—Will you kindly intimate that an International Photographic Exhibition will be held in the Galleries of the Fine Art Institute, Glasgow, in September next, under the auspices of the Glasgow and West of Scotland Amateur Photographic Association. Full particulars will be announced very shortly. Besides the usual classes, there will be a section for photomechanical work.

It may not be amiss to remind our friends in the South that September is a favourite month for a trip to Scotland.

*Glasgow, Feb. 16th.* Wm. Goodwin, *Hon. Sec.*

## THE OPTICAL LANTERN: ITS HISTORY AND DEVELOPMENT.

Sir,—I would feel obliged by your correcting an error which has crept into your report of my paper read before the Glasgow Photographic Association. The name of the French traveller whose writings are referred to should read De Monconys, and not De Moncorrys. William Lang, Jnr.

*Cross Park, Partick, Feb. 15th.*

## PHOTOGRAPHY IN THE CRYSTAL PALACE.

Sir,—I, like Mr. Schofield, am both a season ticket and shareholder in the Palace Company, and have also applied, some time since, to Messrs. Negretti and Zambra for permission to take photographs, and with about as satisfactory a result. I cannot say, however, that I feel the same resentment that he appears to do, as, upon thinking the matter over impartially, it certainly seems hardly reasonable to expect the firm to sustain a considerable annual loss, seeing that, if they granted permission to one, they could hardly refuse another, with the probable result that the Palace would soon become a popular resort for amateurs, who, although pledged not to sell any photos, would be under no obligation not to give their friends copies, which they probably would do with a very generous hand—after the usual manner of amateurs—with the inevitable result of diminishing Messrs. Negretti & Zambra's photographic business, for the exclusive rights of which they pay a large sum annually, and cannot, therefore, be reasonably expected to return a different reply to the very courteous one sent Mr. Schofield. Ernest Dalton.

*Anerley, Feb. 17th.*

## HELIOCHROMY.

Sir,—There is in your last week's issue a mention about another discovery of photography in natural colours. It would be, perhaps, interesting to you to know some facts in connection with the described process. In my recent experiments with ferrotype dry plates I often came across the same kind of effect of colours by reflection as stated by Professor Lippmann. Herewith I send you a specimen which, held against the light, shows very prominently the said result. I will not try to explain it, from fear of putting forward some erroneous theory similar to the one developed by Professor Lippmann, which seems to me rather difficult to prove. In fact, the waves of sound can be compared with such of the white light only, and not with the waves of the spectrum, especially in the actual case; the number of vibrations of the sound and white light being constant, and of those of dispersed colours different with every hue. With the greatest attention paid to the direction of reflected rays, it is impossible to bring them back through the very point they traverse, even if the glass supporting the negative were as thin as paper; consequently, the green rays, for example, may, in their return, intercept the blue or yellow ones, the orange intercept the yellow or red waves, and so on. I shall be very glad to have made a mistake, and to see the report of discovery this time verified; but for a while I think that after more careful examination of Professor Lippmann's spectrum negatives, the colours will be found slightly misplaced, and that we are to-day as far from photography in natural colours as we were a month ago. L. Nievsky.

5, *Gransden Road, Shepherd's Bush, London, 18th February.*

## ROUGH DRAWING PAPER.

Sir,—If Colonel Noverre will turn to the Photographic News for 1873, page 354-5, he will find full instructions given of M. de Constant's method of printing on plain paper, where he mentions, amongst other papers, "Whatman's rough drawing paper." He also mentions a method of giving a coarse grain to smooth paper. I have never seen any of M. de Constant's productions, but I cannot doubt but that he used the roughest paper obtainable, as the word "rough" is especially mentioned, and not "hot pressed," the medium quality of Whatman's paper.

Again, in a leading article in the same journal for the year 1875, page 390-1, on "Drawing Paper for Photographic Portraiture," the phrase "rough drawing paper" is again used, and working directions for preparing the same are given.

You will doubtless have received many other communications referring to the early use of rough surfaced papers in photography, but I pick these two out of my commonplace book as being particularly applicable to the present question.

I do not think that there can be a moment's doubt but that rough drawing paper was used long before the 1887 Pall Mall Exhibition, but at the same time we must freely give Colonel Noverre all credit for the revival of this most artistic method of reproducing our æsthetic impressions in monotint.

Lyonel Clark.

As Professor Lippmann's photographs show the complementary colours by transmitted light, it seems to indicate that, by printing from them upon similarly prepared films, any number of truly coloured positives can be obtained from one negative. The latter might be stripped from a plate, and reversal of the sides avoided in the finished print.

# Proceedings of Societies.

The London and Provincial Photographic Association.

*February 12th.*—Mr. T. Bolas in the chair.

Mr. G. W. Atkins presented Capt. Abney's "Text-Book of Science" to the library.

Specimen prints from cloud negatives, issued by Mr. E. Dunmore, were passed round.

Mr. Atkins showed some slides he had made, using the collodio-bromide process. He also passed round a sample of pyroxyline that he had prepared from a formula published by Dr. Hardwich.

Mr. A. Haddon thought that sufficient attention was not paid by experimenters in making pyroxyline to the specific gravity and temperature of the acid used. He considered this the cause of the inferiority of some samples of cotton. He also exhibited a bottle containing a solution of eikonogen preserved with bisulphite; it had been standing several months, and was quite colourless.

Mr. A. Cowan had kept a solution of eikonogen two years in a bottle, quite full; it had not changed colour.

The remainder of the evening was devoted to the exhibition of lantern slides. An excellent series was shown by Messrs. Mawson and Swan, from negatives on their plates. Slides were also exhibited by Messrs. Atkinson, Pemberton, Kellow, and Wellington.

The Photographic Society of Ireland.

The annual general meeting was held on the 13th inst. at the rooms, 15, Dawson Street, Dublin; Professor J. Alfred Scott, M.B., vice-president, occupied the chair. The report of the council and treasurer's statement of accounts were read, and showed the Society to be both numerically and financially in a very satisfactory condition.

After the necessary business in connection with the election of officers and council for the ensuing year, Mr. Greenwood Pim passed through the lantern a number of slides by himself, and Dr. Cosgrave of pictures taken in Switzerland.

The Lantern Society.

*February 9th.*—Mr. J. Traill Taylor on "Lenses and Condensers for Lantern Work."

Mr. Taylor commenced by saying that in his remarks on condensers, the light was assumed to be small and intense. At present there was no perfect condenser on the market, and the subject was one that might profitably be worked out farther than it had yet been. Mr. E. M. Nelson was the only Englishman who had as yet tackled the subject; in America they had given much more attention to the matter. The back lens of a condenser should be fairly large to include as wide an angle as possible, and as thin as possible on account of the heat, the edges being ground thin for the same reason. The effective diameter of the back lens was considerably less than the diameter of the lens itself, and in the ordinary commercial condenser the margin of the lens to the extent of about half an inch inwards was not utilised. Mr. Taylor showed a drawing of a theoretically perfect condenser to transmit absolutely parallel rays from a small luminant. It was of triple form, and five inches in diameter. He also described Professor Morton's triple condenser, which included an angle of 93 degrees, and he gave the curves for both these condensers. In a perfect lantern, the third lens of the condenser (the one farthest from the light) should be removable, and replaceable by others of different focal lengths. The first two lenses would be arranged to give parallel rays, which could then be converged more or less, according to the purpose for which they were to be used, by the third lens. With reference to projection lenses, Mr. Taylor said that the Petzval portrait lens was the best form, and explained how the flatness of field could be improved by increasing the negative aberration of the back lens.

In the discussion which followed, Mr. G. R. Baker referred to the focal lengths of lantern condensers, and Mr. E. M. Nelson mentioned Professor Abbe's theorem, that the intensity of the light at different distances from the condenser varied as the square of the sine of half the angle included.

The West London Photographic Society.

A meeting was held at the Broadway Lecture Hall, Hammersmith, on the 13th February.

The President announced that he had forwarded a circular *re* cheap railway fares to photographers, to forty-nine London and suburban Photographic Societies for their consideration, and requesting them to fill up the same, with the number of members, to lay it before their next meeting, and say whether their names might be added to the memorial which was to be lodged with the several London railways. A favourable answer had already been received from two societies.

An inquiry from the question-box which had been held over from the previous meeting, as to whether ammonia fumes injuriously affected the lungs, was answered by Dr. Low, who thought that, considering the extent to which the ammonia was diluted before use in the developing bath, no harm could be caused to the lungs, but it might, perhaps, have an effect upon the eyes.

The President then introduced Mr. Wm. Schooling, F.R.A.S., who gave a lecture on the "Application of Photography to Astronomy," illustrated with slides from photographs taken at Harvard and other large observatories. Mr. Schooling said that photography had not helped them much with regard to the detail on the surface of the moon, and the spots on the sun—in fact, more truthful effects were got with sketches; but that with regard to distant stars, some of them were rendered with great exactitude on the photographic plate, though not visible to the eye through the most powerful telescope in use.

Mr. Whiting thought that astronomers might with advantage turn their attention to the discovering of some emulsion that would give a less coarse image than that given by gelatine; he suggested slower plates, and thought that at the present time albumen would be the best thing to use.

Mr. Schooling said that owing to the movement of the planets, it was necessary to use as rapid a plate as possible.

The Hackney Photographic Society.

Last Thursday Mr. Henry Sturmey gave an interesting and amusing lecture on "Norway," in which he described his trip there. About one hundred slides were put through the lantern, which was worked by the hon. secretary.

The Society now possesses a fine single lantern, together with all appliances. At the close of Mr. Sturmey's lecture, Messrs. Dean, Gosling, Barton, and Herbert Smith showed slides.

The Richmond Amateur Photographic Society.

At the weekly meeting on the 13th inst. there was a good muster of members; Mr. Cembrano presided.

A discussion took place on "Exposure and Exposure Tables," to which most of those present contributed—from the tyro who confessed that he had no ideas on the subject which could be of the smallest use to any-one else, to the veteran of wet-plate days, who looked upon exposure tables much as a man looks upon swimming-corks who has learnt swimming without them. The longest exposure on record was stated to be one of several months given to a dry collodion plate in the Catacombs, while the shortest went into millionths of a second.

Two new members were elected.

The Birmingham Photographic Society.

The above Society held a lantern evening on Wednesday, the 11th inst., at the Temperance Hall. Slides were lent by the Camera Club, Messrs. J. B. B. Wellington, Fry and Co., Sands and Hunter, Pumphrey, and others.

It was announced that the first meeting at the committee room of the Midland Institute would be held on the 26th inst., when papers on "Shutters" and "Instantaneous Photography" would be given.

THE PUDSEY DISTRICT PHOTOGRAPHIC SOCIETY.

On Thursday evening, February 12th, a meeting was held at Pudsey, near Leeds, for the purpose of forming a photographic society for the district; Mr. J. Goodman presided, and several local amateurs were present.

It was decided to hold the meetings fortnightly, at the Mechanics' Institute, and at the next gathering there will be an exhibition of members' slides. Mr. W. H. Hining will act as secretary until the election of officers.

THE DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

General meeting, February 12th; Mr. J. D. Cox, president, in the chair. This being a lantern evening the meeting was open. The members and their friends, through the kindness of Mr. A. R. Dresser, were enabled to view a large number of slides illustrating Brittany.

Several of Griffith's hand-cameras were sent for exhibition.

THE LEEDS PHOTOGRAPHIC SOCIETY.

On Monday evening last the second of the series of elementary lectures was given by the hon. secretary, Mr. T. A. Warburton; his subject was "Development." He advised the backing of all plates with burnt sienna in order to prevent halation. He said that, with respect to exposure, a little experience gained by exposing a couple of dozen plates upon, say, half-a-dozen different subjects, making three or four exposures of varying lengths of time upon each subject, carefully noting the conditions as to plate, subject, stop, and light, and, after development, making a note of the result, was worth all the exposure tables yet invented. An exposure book of this kind formed a record of actual experience, which would, with constant additions, in time become invaluable. In the course of his lecture, he said that he preferred the pyro-ammonia developer and the bichloride of mercury intensifier, followed by ammonia. In conclusion, a frame of negatives of different qualities, illuminated from behind by the lime-light, was exhibited. The class of negative most suitable for any particular printing process was pointed out.

The president, Mr. Godfrey Bingley, occupied the chair.

THE NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual fortnightly meeting of this Association was held on Monday evening last, with Mr. S. Wells, president, in the chair.

Mr. Councillor Abraham Pyatt and Mr. Thomas Warwick were elected members.

Mr. Howson, of the Britannia Works Company, gave a practical demonstration on Alpha paper, printing, exposing, and developing several prints, and obtaining excellent results. Mr. Howson also exposed and developed several of the Alpha lantern slides.

The Hon. Sec., Mr. P. E. Knight, distributed, by the kindness of the Paget Prize Plate Co., samples of their specialities.

The Society has done much in lantern slide making, every evening having been devoted to demonstration. The results form a nucleus for a loan collection for exchange with other societies.

"The present state of the photographic profession I attribute entirely to want of union amongst its members, and the only remedy that seems possible is the encouragement of greater unity, and the formation of a strong photographic public opinion. For the formation of such a body of public opinion I can see no means so efficient as the photographic journals."—H. Snowden Ward.

H. W. Vogel, Berlin.—Received, and shall have attention.

C. P. Richards, Barrow-in-Furness.—The report of which you speak in yours of the 18th not to hand up to the time of going to press, and now too late. It should have been posted the day after the meeting at Birmingham.

Correspondents are requested to make their communications as short as the importance of the subject will permit; otherwise they may remain unpublished for a month or two for want of space. We are overpressed with surplus manuscript.

# Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

M. B.—*Camera Details.* Received your letter. We shall be prepared to act upon your suggestion when the time comes. The weight of camera is correctly stated, and the $f/16$ stop is manifestly only half the diameter of $f/8$; the ratios of exposure would, therefore, be as four to one.

J. H. C.—*Bitumen Process.* Instead of using your present mixture, which is almost sure to crack the film on drying, try the employment of a varnish composed of asphaltum in benzol. Do not fire it, or add any lamp-black, or only sparingly, as required for thickening, but dry on a levelled hot plate.

A. Corsi (Florence).—*Primuline Materials.* Apply to Messrs. Green, Cross, and Bevan, at 4, New Court, Lincoln's Inn, London, W.C., for samples and paper of instructions, sending postal order for ten lire.

M. T.—*Watkin's View-Meter.* The standard tint is obtained by two seconds' exposure to "clouded sunshine in June," but, as this mode of working cannot be available at the present time, the inventor prescribes, as its equivalent, the burning of two grains of magnesium ribbon at a distance of $4\frac{3}{4}$ inches from the sensitive paper. For further details see report of technical meeting, Photographic Society, of October 28th last.

W. D.—*Lord Rayleigh's Wire Gauze Experiment.* The pieces of wire gauze distributed to the visitors at the Royal Institution on the 6th inst. measured twenty meshes to the inch, and is known as No. 20 gauze. There is no particular necessity for this precise dimension, but the experiment answers capitally well with such material.

Subscriber.—*Photography in Natural Colours.* As usual, we prefer to wait for a fuller statement of the scientific details; for the published account from Paris, like that of last year from Vienna, records no more than has been known for thirty years. All turns upon whether these pictures are permanent in daylight, for hitherto they have never been successfully fixed. Did you read M. Leon Vidal's letter in last week's News? These rumours seem to crop up periodically, but one must not say they are altogether impossible of realization—only improbable, so far as the evidence goes at present.

S. H.—The case is one which might very well be brought to the notice of the Photographers' Benevolent Association. Report the facts to Mr. H. J. Beasley, Hon. Sec.

Photargus (Spain).—1. *The Graduated Background Material,* for vignetted heads and portraiture generally, can surely be obtained of Messrs. Marion and Co., in this country; but if you find any difficulty in getting it in your southern marts, nothing is easier than to prepare it for yourself by dyeing from a slow bath, out of which you lift the material gradually by winding it on a wooden roller. 2. The less said on this point the better, for recent accounts are not very encouraging.

F. L.—The person named is now in the United States of America, but we can write to him and put the enquiry.

Ed. J. B. (Cheltenham).—The publishers of Mr. Wilkinson's "Photo-Litho Manual" are Messrs. Hampton, Judd, and Co., 14, Duke Street, Adelphi, W.C.

Teignbridge.—*Eikonogen.* There is only one source of supply in this country, and you must go to Soho Square for the "cartridges."

G. A. N.—*Ferrotype Plates,* of sizes 14 by 10 and under, can be had of Mr. Jonathan Fallowfield, 146, Charing Cross Road, W. They can be readily cut of circular form with a pair of scissors.

F. D. T. (Edinburgh).—Let us know in the event of your having any difficulty in procuring one of the little specimen films, and we will try again to assist you.

THE PHOTOGRAPHIC NEWS.

VOL. XXXV. No. 1695.—*February* 27, 1891.



CONTENTS.



## HE NEW DISCOVERIES IN HELIOCHROMY.

HIS month of February, 1891, will long be celebrated the annals of photography. At the beginning of e month, photography in natural colours as a pracical working, every-day process seemed a problem likely to be solved during the present generation; at e end of the month the solution of the problem seems th possible and probable; moreover, in a scientific it uncommercial sense it has already been achieved.

Becquerel seems to think that his process is ifferent in principle from the new one, but that is pparently a mistake. His heatings of the sensitive lm on a silver plate probably gradually altered the cheesy" physical structure of the film to one of a mewhat more transparent nature, so that the bright irface at the back brought interference phenomena ito play, and yielded coloured images, which dissolved ith the rest of the film in fixing solutions. In somehat similar processes upon paper, the preliminary xposure to diffused light probably produced a number f minute particles or spangles of reduced silver, which cted as imperfect reflectors, and produced imperfect iterference phenomena. The film having been rencred an objectionable colour by the first exposure, the eliochromic photographs on paper never had the same rilliancy of colour or the more suitable background f those on plates of polished silver. Becquerel orked most industriously, yet empirically, with no amp to guide his footsteps, and, under the circumstances, the results were remarkably good, but would ot long resist the action of daylight. Professor lexander Herschel once published that he had seen a hotograph of the spectrum by Becquerel good enough o figure as the coloured frontispiece of a scientific ook. We also have seen one answering that descripion in the possession of the late Warren De la Rue, ho first exhibited it to us more than twenty years ago, nd again did so quite recently, but a few months efore his death. It did not seem to have deteriorated neanwhile, but its owner kept it excluded from light n a leather case, except when momentarily showing it o visitors. He had another of these photographs of the spectrum, which once belonged to Faraday, but this was a poor one, and required a certain amount of faith to recognise the colours. Probably it had not always been carefully protected from light before it reached Mr. Warren De la Rue.

The theory of Becquerel's photographs was not understood, but it was speculated that the colours might be those of thin plates, or that the molecular condition of the film was so modified by light that the particles threw off the particular colours by which they had been impressed.

Professor Lippmann has scientifically solved the problem by declaring them to be the colours of thin plates, and by using continuous and almost transparent films resting upon a brilliant reflecting surface, so as to get nearly perfect interference bands in the film, he has succeeded in photographing colours. He has also revealed that the layers of silver deposit in the film should be colourless, and that incident daylight would cause different colours to be reflected, according to the distances apart of the bands in any particular part of the film. This makes future investigation easy, for the practical photographer who seeks to perfect the process now knows what result he has to try to obtain, and how to set about the work. The secret also has been revealed how and why the photographs can be fixed.

Without having seen them, it is easy to realise the nature of the colours obtained, and to describe their pictorial character. They are those of the diffraction grating, and, like Daguerreotypes, can be seen best with a particular incidence of white light. They resemble the interference colours of mother-of-pearl, but are brighter, and M. Lippmann says that they are purer than those of the soap-bubble. Those who want to see the colours of the soap-bubble in perfection should blow bubbles from a solution like that used by Lord Rayleigh, and described in these pages last week; the bubble should be illuminated on one side only, and by a strong light, such as that coming through the condensers of a limelight magic lantern, and should be viewed by the light the bubble reflects. The correspondent of the *Daily News* describes the colours obtained by M. Lippmann as equalling in brilliancy those of a finely cut Golconda diamond; why "Golconda" we know not, for the Brazilian diamonds are of as "clear water," and can be cut in the same way. The working of the Indian mines was entirely or for the most part stopped years ago because the yield was not remunerative; we have not heard of any resumption there of the search for the gem. The lustre of the wings of some green and other beetles, also of the wings of some of the more gorgeous tropical butterflies, is supposed to be due to the interference of light set up by numerous transparent, horny layers.

The conclusion, therefore, is, that in these heliochromes we have brilliant colours not to be seen elsewhere at present in connection with any branch of pictorial art. Such pictures, somewhat less perfect in colour, were to be seen once, for Niepce de St. Victor, one of the imitators of Becquerel, appropriated the best of discoveries in heliochromy without acknowledgment, and succeeded in turning out some remarkable pictures by means of long exposures in the camera. If Niepce de St. Victor were allowed to dress a doll in such materials and of such colours as he chose, he could somewhat faithfully produce a photograph in the true colours of the doll, and one of the most remarkable facts was, that gold ornaments did not come out upon the plate of an ordinary yellow colour, but with metallic lustre, resembling gold itself.

Before long, in the light which M. Lippmann has thrown upon the subject, varieties of colour will give less trouble in heliochromy, because orthochromatic photography is now a fact, and will aid in the work. By cyanine and other agents the films used in M. Lippmann's may be made sensitive to the red; they can also be made sensitive in the usual way to the yellow. In most cases it will probably be necessary that the dye used shall be washed out of the film, and, possibly, the use of a faint yellow screen may be an advantage.

The quickening of the films used in M. Lippmann's process seems to be but a question of time and of experiment, chiefly by experienced photographers. The production of a dry plate and devising of a developer, which together shall yield an image silvery white by reflected, and of a pure black tint by transmitted light, is also a matter likely to be suitably accomplished with lapse of time.

Perhaps the most beautiful stereoscopic portraits ever produced were those upon Daguerreotype plates, with the images afterwards delicately tinted by hand. Some such were on view at and after the opening of the Crystal Palace at Sydenham, and they were exhibited, we think, by Claudet; they proved a great attraction to the visitors. How somewhat similar portraits, but with the rainbow-like hues produced by M. Lippmann's process would appear, has yet to be seen; he might make a beautifully-coloured doll sit for its portrait in the first instance, to reveal what is in store in this direction in the future.

With a mixed body of readers such as this journal possesses, many of them highly scientific, some semi-scientific, and others not scientific at all, but purely artistic, it is difficult to meet the mental requirements of all in one article, so the first-mentioned class may excuse us if a little be now said for the information of others about the well-known phenomena of the interference of light upon which the new heliochromic process depends.

If two stones be dropped vertically, and at a few yards from each other, into a pond of still water, each stone will initiate a circular series of waves, extending ring-like in all directions. If, when the two outer rings meet, the crests of one series of waves tend to coincide with the crests of the other series of waves, increased wave motion will be the result of their meeting. If, on the other hand, when they meet the crests of one series of waves tend to coincide with the depressions of another series of waves, as represented in figure 1, the

*Fig.* 1.

two series will neutralise each other; thus, two motions produce no motion. "Beats" in music are due to the same cause; at intervals two sound-waves of air occasionally meet in such a manner as to produce momentary silence. So is it with light. Waves of monochromatic light can be experimentally so mixed as to produce darkness in bands upon the screen of a lecture room, and it is often done in public.

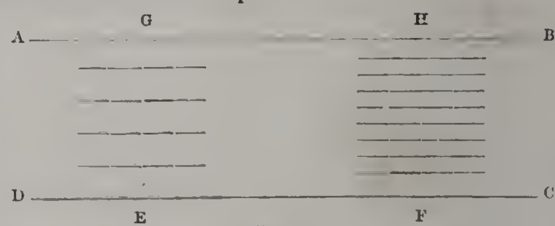



*Fig.* 2.

Let A B C D be a section of a sensitive film, and D C a mirror backing; red light falling in the direction G E will be reflected at E and sent back, producing interference bands, in the luminous spaces between which silver will afterwards be deposited by the developer. Let blue waves fall in the direction H F; the same phenomenon will be repeated, but the blue waves being shorter than the red, the interference bands will be closer together. Suppose, now, the plate to be developed and fixed, then exposed to daylight; the blue rays alone in white light will pass freely backwards and forwards through the area H F, and the red rays freely through the space G E; hence the difference in the colours of these spaces to the eye, although the silver deposits themselves are practically colourless.

All this suggests the use of a developer which will produce images more resembling stains than coarse deposits, so as to produce as perfect and clean a series of bands as possible; in fact, M. Lippmann has laid down a useful, practical working hypothesis, which seems at present a true theory, and may afterwards be proved to be such.

A few months or even a few years may elapse before photography in colours becomes an every-day, familiar fact, but such a result now appears to be within measurable distance.

## THE MAGIC LANTERN MISSION.

The accomplished editor of the *Review of Reviews*, amid his various schemes for the help of the poor, has propounded one which cannot but be of interest to the photographic world, for it centres round that now familiar instrument, the optical lantern, and, as everyone knows, photography has done more to make the instrument popular than anything else; for it has produced, at a marvellously cheap rate, pictures rich in detail, illustrating all parts of the world, and every branch of knowledge, before which the hand-painted slides of a bygone generation have all but disappeared.

The Magic Lantern Mission has a very wide scope, but its primary object seems to be to make religious services in Sunday schools, chapels, and even churches more popular by means of pictorial illustrations. It seems to be admitted that in this work difficulties will arise, for it is evident that photographs can have but limited application in the illustration of Bible history; indeed, beyond photographs of the Holy Land, and photographic copies of well-known drawings and paintings, it cannot go, unless the promoters of the enterprise are prepared to incur great expense in the employment of special artists to draw designs for them, or to photograph from living models. Beyond this, it is intended that the lantern shall be the prime teacher of a "democratic university," and shall help in a popular system of university extension teaching. Preaching Friars of the lantern are "to undertake to establish in every town and large village a centre of culture, illustrated history, and politics, which will be "attractive enough to command the attention of the corner boy, and yet sufficiently elevated to give instruction to the best informed." We learn incidentally that a certain tea company has in circulation a two hundred guinea lantern and a set of slides, and that they are willing to send the instrument and a capable operator to any town desiring a lantern service, on payment of expenses to and fro. Of the eighty slides "there are only three that can be said to be advertisements of the tea company." The commercial aspect of the enterprise peeps out in another place, for we hear of a firm of country opticians "who are sincerely devoted to the work of Christian Evangelisation," and are delighted to place their lantern at disposal for £2 per night. We fancy that most opticians would be content to provide apparatus for this sum without mixing up a business transaction with more serious considerations.

The Mission aims high. It is rightly stated that there is room for improvement in the art of colouring slides. There is a need, we are told, for a school of slide painters to be attached to the Mission—not mere slide colourers, but painters who feel with and for their subject. Many other hints and suggestions, which we have not space to particularise, are given with regard to carrying out the scheme.

It will thus be seen that the Magic Lantern Mission aims at a general system of education by means of pictures, and the scheme is one which is sure to prove attractive to those who are not acquainted with what has already been done in the same direction. In this respect it resembles the far vaster scheme propounded by the author of "Darkest England." But those who know how largely the lantern is already in use will be apt to regard the various proposals in the light of what our American friends call "chestnuts."

We venture to say that there is no town or village of any size where the lantern is not already a most familiar means of entertainment and instruction. Our wholesale dealers in lantern slides publish continually new sets of excellent pictures dealing with every conceivable subject which can teach or interest an audience. These sets are bought by all the chief opticians throughout the country, and are let out on hire, with capital readings written by experienced men, to amateur lecturers, clergymen, and others, night after night. It is true that the colouring is sometimes a little gaudy, but this is merely a question of expense. Beautifully coloured slides can be had if the artist is paid a fair sum for producing them, and directly the demand comes for such pictures it is certain that they can be supplied; in short, a most complete organisation for the production and circulation of slides already exists, and it seems childish that a work which is already being done so well, and which competition has made so cheap, should suddenly be placed in untried hands.

As to a new system of University Extension teaching, there is nothing new about it. The suggestion is another "chestnut." Every town has its literary institution or mechanics' institute. Failing these, it has some kind of lecture society, where good lecturers are constantly employed, and where the lantern forms a feature of the proceedings. The business arrangements are so well managed that a ticket admitting to every entertainment of the season can be purchased for a shilling or two. But free lectures are also common. Take, as an instance, those inaugurated at the East End by Dr. Barnado, to which an audience of more than three thousand are attracted every week. In some places, indeed, we learn on good authority that the lantern is almost too common. There are so many amateur workers, and they are so ready to give their services in aid of charities of various kinds, that the lantern does not attract as it once did. Of course this is due, to some extent, to incompetent operators and lecturers, for unless an entertainment of this kind is placed in experienced hands, and carried out by means of good apparatus, it is more dreary than amusing—to say nothing of the educational part of the work. As to the use of the lantern in religious services, that, too, is no new idea. In every optician's catalogue of slides long lists of hymns are given, together with such subjects as "The Pilgrim's Progress," "The Holy Land," and a large variety of semi-religious temperance tales.

If these things can be improved, the best way to do it is to make use of the existing organisation, and to place the matter in the hands of those who have for years made a study of the business. To commence anew on the same lines with amateur producers is to court failure.

## PLATES FOR HELIOCHROMY.

BY GABRIEL LIPPMANN, MEMBER OF THE INSTITUTE, PROFESSOR OF THE FACULTY OF SCIENCES, PARIS.

Every grainless plate I have tried has been found to answer. For instance:—

1. Common albumen plates, but it is best to have the coating of albumen thicker than usual.

2. Taupenot plates, with a double or triple layer of albumen.

3. Gelatino-bromide of silver prepared as follows:—In one hundred grammes of water dissolve ten grammes of gelatine, and half a gramme of bromide of potassium. Filter, spread on glass, and let dry. Sensitise more than five minutes in a twenty per cent. solution of nitrate of silver, with a little acetic acid; wash and dry. Develop with pyrogallol and sesquicarbonate of ammonia, in the same way as Taupenot plates. Wash with water, then with slightly salt water. Fix.

## THE CAMERA AND ITS VARIOUS MOTIONS.

BY PROFESSOR W. K. BURTON, C.E.

### Chapter VI.—Dark Slides, Changing Boxes, Roll-Holders, etc.

*Dark Slides.*—As in the case of the camera, so in that of dark slides, I should incline to put absolute light-tightness as the first essential.

It is scarcely necessary, in treating of appliances for landscape photography of the present day, to consider other than *double* dark slides, and these may be classified as slides that open in the middle, book form, the slide being thus opened for inverting the plates, and slides that do not thus open, the plates being inserted from one side, or from the end. It is the rule, in the case of the former kind of slide, that the shutter does not draw out entirely, but only far enough to uncover the plate, and then doubles back with two hinges, so that it will not catch the wind, or be in the way; in the case of the latter, the shutters generally draw out entirely, what may, perhaps, be called a *valve* closing across the opening left by the shutter. The former kind of slide has, at all times since double dark slides were first introduced, been the favourite in England; the latter has for long been preferred in America.

It is a matter of opinion which kind of slide is to be preferred. I confess, without hesitation, that I prefer what is commonly called the "American pattern," which does not open book-wise, but is so made that the plates are both inserted from one side, a sheet of blackened tin or zinc going between them. The advantages that I have found are greater lightness, and less danger of leakage of light; whilst I have often found the shutter, drawn from the slide just at the time of exposure, to be very useful as a sunshade for the lens.

The only objection that I know to this form of dark slide is that the plate that is last inserted, at least, cannot rest against a rebate, but must rest, at one end, at any rate, against small, metallic movable catches, and that the result is a possible slight want of register. With carefully made slides, however, this possible lack of register is so small that it is not of any consideration in the case of landscape work.

It is commonly said that the American pattern of slide is good enough for small sizes, but that it is of no use for those of large size. I cannot speak as to *very* large sizes, but I can state that, nearly ten years ago, I had three 12 by 10 slides of the kind in question made by the elder of the two Messrs. Collins, who has died within the last few years, the shutters being made of three veneers with grain crossed; that these shutters, in spite of the very roughest usage, served me well for some six or seven years, and that although, after that, they passed from my hands, I know them still to be in good condition. In America, vulcanite—a sort of thick cardboard—or sometimes ferrotype plate, is generally used for shutters.

Even when the "book-shaped" form of dark slide is used, I advise that the black opaque sheet of metal that separates the plates be not hinged to the dark slide, but be loose. It is thus possible to use carriers for two plates of smaller size than that of the dark slide, both plates being inserted from one side, an opaque sheet of the size of these small plates going between them. I consider that such a double carrier is to be preferred to two single carriers, as the latter have to be made so very thin.

Metallic dark slides have, of late, come much into use. The chief advantage that they offer is that, whilst so long as they are not actually indented by a sharp blow from any hard body they are as efficient and as enduring as wooden slides, they are very much cheaper. Moreover, they pack into a smaller space.

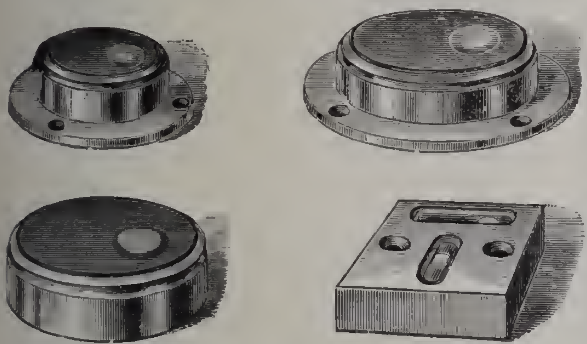
*Changing Boxes.*—A changing box is an appliance for storing a number—generally a dozen—of plates, any one of which may be brought into position for exposure. These are ingenious contrivances, but it would be quite out of place to go into details of their construction here. They are not to be recommended for large sizes. I know that the maker of one of the best changing boxes made, although he does not absolutely refuse to make a larger size than 10 by 8, tries to dissuade his customers from giving orders for such. It might, indeed, perhaps be said that dark slides are to be preferred to changing boxes for all sizes over 8½ by 6½.

*Roll-Holders.*—The difference between roll-holders of one kind and another is not, as in the case of dark slides, merely the difference between one type of apparatus and another. It is a case of the difference between the different patented inventions of different firms, and as, in such a case, it would be invidious to make comparisons, the roll-holder must here be dismissed with a word only. Indeed, the only thing I really want to point out here is that only a small fraction of the advantage of films is realised unless a roll-holder is used. The only objection to the roll-holder that I know of is, that it makes exposing so *very* easy that the user is liable to keep shooting away at all and sundry kinds of things without due consideration.

*Levels, &c., for Securing Vertical Adjustment of the Camera Back.*—When architectural work is done, it is essential that the back of the camera be vertical. A slight deviation from the vertical will not give appreciable distortion so long as the angle included by the lens is not great, but if a wide angle be included, a very small deviation from the vertical will produce a most noticeable effect.

For this reason, many modern cameras are fitted with some appliance for showing when the back is really vertical. The commonest is a spirit level fixed on to the top of the back. When this top is horizontal, the ground glass is vertical. If there be but one level, it is fixed pointing "fore and aft," as this direction—or, more strictly, in a plane at right-angles to it—is that in which verticality is of most importance. Any accidental tipping to one side or the other can easily be detected by "sighting" down one side of the camera back along with any vertical line in the building that is being photographed. Moreover, the effects of mere "side tipping" of the camera can always be corrected afterwards by sacrificing a little of the margins of the prints, trimming parallel with and at right-angles to vertical lines.

Moreover, two levels at right-angles to each other, or a circular level, which serves the same purpose, is used.



Subjoined are illustrations of levels for cameras as manufactured by Messrs. Taylor, Taylor, and Hobson. Another arrangement is to have a small brass plummet suspended at one side of the back, as will be seen in the cut, page 1001, December 26th, 1890.

Some photographers prefer to carry in their pockets a bullet, or other light weight, hung on a piece of thin string, and to hold this in the hand as a plummet. It may be worth while remembering that, if a knot be made at a distance of thirty-nine inches from the weight, and the weight and string be swung as a pendulum from the knot, each single swing will be practically a second. If the length be ten inches, it will be half a second.

So far as side tilting of the camera goes, it is often possible to avoid this by "sighting" any vertical line in the subject in front, and one side of the back of the camera.

---

THE ENFIELD CAMERA CLUB.—At the meeting on the 18th inst. five new members were elected.

ROYAL INSTITUTION.—Professor C. Meymott Tidy will on Thursday next (March 5th) begin a course of three lectures on "Modern Chemistry in Relation to Sanitation."

PORTRAITURE.—In a reprint, from *Poet-Lore*, of a paper read before the Melbourne Shakespeare Society on "Shakespeare's Face," the following remarks occur:—"If there is one thing more productive of utter despair than another, it is an attempt to reconcile the conflicting opinions provoked by portraiture. No two artists will give portraits of one individual that absolutely agree; no two critics will agree about their relative merits as likenesses, and ordinary people comparing portraits with faces invariably differ with varying degrees of disagreement."

THE PHOTOGRAPHIC CLUB.—This Club has issued a pamphlet, compiled by Mr. Mackie, about its early history. It was indirectly founded in 1879 by Mr. Arthur Brittlebank; the first meeting was held at his studio, 3A, Tottenham Court Road, London, on June 18th of that year. The Brittlebank meetings soon came to an end, but their advantages were so fully recognised that some of those who took part in them founded the Photographic Club. The foundation meeting was held November 7th, 1879, at the Freemasons' Tavern, with Mr. Jabez Hughes in the chair. The Club has just issued its annual report and balance sheet. The Club now holds its meetings every Wednesday evening at Anderton's Hotel, Fleet Street, London.

## LANTERN SLIDES.

BY F. GOLDBY.

DURING this exceptionally dull and inclement winter, out-door photography has been next to impracticable, and no doubt many amateurs have—as I have—devoted the greater part of their spare time to lantern work; so possibly the following notes, though they may contain nothing new to more experienced workers, may perhaps prove of some interest and use to those who, like myself, are beginners in this most fascinating branch of photography.

During a short holiday spent in Switzerland last August, I obtained some five dozen half-plate negatives of scenery in the Bernese Oberland, and from these and others taken nearer home I have been engaged in spare time for the last two months in making slides. In order to reduce from these half-plates to lantern size, I employed at first two cameras—my ordinary half-plate to take the negative in one of the double backs, and a smaller camera with lantern plate carrier and rectilinear lens: the lens of the latter being inserted in the lens aperture in the front of the former. But the two necessary adjustments for placing the image rightly upon the lantern plate, and at the same time focussing, proved so troublesome that I soon gave it up, and invested in one of the fixed focus reducing cameras now sold at a very low price by all photographic dealers. This last is provided with a single lens, which gives practically straight lines upon the lantern plate, and I have found it most convenient and useful.

One caution is, however, very necessary in using such a camera, viz., to take great care that no light enters during exposure except through the negative. I find it even necessary to mask the edges of the negative, and this is best done by pasting a narrow strip of black or orange paper on each side of the negative at the back, well covering the blank margins, and allowing the paper to overlap about an eighth of an inch, so that the pieces of thick cardboard used for filling up the side spaces may be pushed under the overlapping paper. If this be not carefully done, a marked difference in the brilliancy of the slide will be perceptible, and there will be a constant tendency to "veil." Most of my negatives are on celluloid, but the difficulty of getting these to lie flat was easily overcome by slightly widening the grooves at back of the reducing camera, so that they would admit the film between two thin plain glass plates.

The lantern plates I have been using have been chiefly gelatino-bromide, the chloride plates being tediously slow for printing in the camera with such a light as has been available for some months past; and at times, even with the bromide plates, I have found it much more convenient to use magnesium ribbon than to trust to the uncertain daylight, and have obtained very good results upon plates so exposed. The quantity required was from one to four or more feet, according to the density of the negative and the tone required.

As regards the development of lantern slides, there is no doubt that hydrokinone is the easiest and cleanest developer in working, and has least tendency to give fog; but for my own part I much prefer pyrogallol, as the warm tones it gives with full exposures are to me so much more pleasing than the cold blacks of the hydrokinone-developed slides.

In working with the pyro developer, a large proportion of bromide is necessary. The average developer should contain about three times as much bromide as pyro by weight, a little more or less according to exposure and tone required. Ammonia with the pyro gives warmest tones. The alkaline carbonates of potassium and sodium give dirty green images, which, however, are capable of taking a purple tone in a sulphocyanide toning bath. Purple and blue tones may also be obtained with hydrokinone by giving a long exposure, and adding to the developer, as a restrainer, in addition to the ordinary proportion of bromide, about two grains of chlorate of potassium to each ounce, and afterwards toning as above. The addition of chlorate of potassium was suggested by Mr. Fitch, whose negative films on celluloid I have been using. Possibly bromate of potassium may be better than the chlorate, but I have not yet had an opportunity of trying it.

Metabisulphite of potassium is recommended to be used with pyro developer by makers of some plates; it acts both as a restrainer of development, and as a preservative of the pyrogallol; but as, on dissolving the metabisulphite in water, it appears to be immediately decomposed, being reduced to sulphite with liberation of free sulphurous acid, I fail to see any advantage in its use above adding sulphurous acid to the solution of pyro with sulphite of sodium. The restraining power of the metabisulphite, I believe, is merely due to the neutralisation of a portion of the alkali used in the developer by the sulphurous acid liberated.

The following is a formula which I have been using latterly, and find to give good results :—

| | | |
|---|---|---|
| A.—Pyrogallol | ... ... ... ... | 30 grains |
| Sulphite of sodium | ... ... ... | 80 ,, |
| Sulphurous acid ... | ... ... ... | $2\frac{1}{2}$ drachms |
| Distilled water ... | ... ... | to 4 ounces |
| B.—Ammonia (·880) ... | ... ... ... | 1 drachm |
| Bromide of ammonium ... | ... ... | 96 grains |
| Ferrocyanide of potassium | ... ... | 40 ,, |
| Distilled water ... | ... ... | to 4 ounces |

Equal parts of A and B for development. This developer I find to work quickly, gives rich, warm tones with correct exposure, and the same solution may be used for at least two plates. I am rather doubtful as to the utility of the ferrocyanide, but am inclined to think it has some effect in preventing fogging or veiling. If the slide should, after development, show any fogginess—which will not occur if correct exposure has been given—it may be quickly removed by using Farmer's ferridcyanide reducer, consisting of a weak solution of hyposulphite of sodium, about one ounce to a pint, to which are added a few drops of a ten per cent. solution of ferridcyanide of potassium. The action is very rapid, and any filminess or veil soon disappears, when the plate should be quickly removed from the dish and rinsed well under a tap. If the fog has been caused by over-development, the reducing action may be allowed to continue until the image is of the right density; but if a case of over-exposure, it should be stopped immediately the veil is removed, and the slide intensified after thorough washing.

With eikonogen as a developer for lantern plates I have had little experience; like pyro, it has a tendency to fog if not well restrained with bromide. With comparatively short exposures it gives good black tones similar to those obtained with hydrokinone, and with long exposures and powerful restrainer an olive green image is obtained, which is capable of taking a fine purple tone in a sulphocyanide toning bath. I append the formula I have been using, and which I have found to give fairly satisfactory results with long exposures and after-toning :—

| | | |
|---|---|---|
| A.—Eikonogen | ... ... ... ... | 24 grains |
| Sulphite of sodium | ... ... ... | 160 ,, |
| Warm distilled water | ... ... ... | 2 ounces |
| B.—Carbonate of sodium | ... ... ... | 40 grains |
| Carbonate of potassium ... | ... ... | 40 ,, |
| Ferrocyanide of potassium | ... ... | 20 ,, |
| Bromide of potassium ... | ... ... | 12 ,, |
| Distilled water ... | ... ... ... | 2 ounces |

For toning I have used one of the baths recommended for the aristotype paper with good effects, as follows :—

| | | |
|---|---|---|
| Sulphocyanide of ammonium | ... ... | $\frac{1}{4}$ ounce |
| Alum | ... ... ... ... ... | $\frac{1}{4}$ ,, |
| Saturated solution of carbonate of ammonium | ... ... ... ... | 5 drops |
| Distilled water | ... ... ... ... | 5 ounces |

Dissolve, and add one grain of chloride of gold.

This bath will remain good for a long time, but should be replenished with more gold as it becomes exhausted.

The cyanide of silver intensifier is particularly useful in the making of lantern slides, especially when hydrokinone has been used as the developer. The disagreeable muddy tone caused by over-exposure may be entirely remedied by its means. In the case of such an over-exposed slide, it is better, before intensifying, to immerse the plate for a few seconds in the above-mentioned ferridcyanide reducer. This will remove any trace of fog which would otherwise be intensified with the image. Then wash perfectly free from hypo in running water, and soak in the following solution till well bleached :—

| | | |
|---|---|---|
| Perchloride of mercury ... | ... ... | 1 drachm |
| Bromide of potassium ... | ... ... | 1 ,, |
| Distilled water ... | ... ... ... | 8 ounces |

After bleaching, the plate must be again thoroughly washed; for a lantern plate, one hour in running water is sufficient; then immersed in this solution :—

| | | |
|---|---|---|
| Nitrate of silver (crystals) | ... ... | 1 drachm |
| Cyanide of potassium ... | ... ... | 1 ,, |
| Distilled water ... | ... ... ... | 8 ounces |

The plate should be removed from the cyanide as soon as it is thoroughly blackened; if allowed to remain, a reducing action soon commences. The cyanide of potassium, Dr. Reynolds tells me, should be the pure crystalline, not the commercial. This intensifier not only greatly improves the colour of the image, but also appears to give it greater brilliancy.

The use of a clearing solution after development does not appear to me to be always necessary. I have found that recommended by Mr. Edwards useful, consisting of ferrous sulphate, citric acid, and alum. If the slide has been, or is to be, reduced by the ferridcyanide method, the ferrous sulphate must be omitted, or a blue stain in the film will result from a deposit of Turnbull's blue.

After the final washing of the plate, it has been my practice to immerse the slide for five or ten minutes in strong methylated alcohol. I do not know if this has any bad effect, but it seems to me to have two great advantages: firstly, the spirit hardens the film; and secondly, the slide dries so quickly after this treatment that there is little chance of particles of dust collecting upon the wet gelatine film, which often occurs when slides are left for one or two hours to dry in an ordinary room.

For binding the slides when finished, I prefer a good stiff paste, and to choose my own coloured binding paper, to using the adhesive strips supplied by dealers; it is a convenience also to be able to cut the strip to any width required. A paste prepared as follows answers well, and is very adhesive:—

| | |
|---|---|
| Flour ... ... ... ... ... | 1 ounce |
| Alum ... ... ... ... ... | 60 grains |
| Camphor in fine powder ... ... ... | 30 ,, |
| Water ... ... ... ... ... | 5 ounces |

Mix well, and boil till thickened. This will keep well, but will remain good much longer if one grain of perchloride of mercury be added, and the paste preserved in a wide-mouthed corked bottle.

## THE PORTRAITURE OF THE MOON.

BY JAMES MEW.

"In what manner," asked the wise men, "did you see the moon?" He answered them: "As I was ascending the pass of the Edomites, and I saw her crouching between two rocks, with a head like a calf, ears like a kid, horns like a hart, and her tail between her legs, and, when I had given a glance at her, I trembled violently and fell backwards." Such is an early account of the appearance of the moon, given in the Babylonian *Talmud* in the treatise on the New Year in the commencement of its second chapter. Among the many strange pictures of the moon which have been presented to the world by—shall we say—impressionist artists, this is probably not the least strange. But there is, beyond all doubt, some esoteric explanation of this marvellous vision of the moon which would be found, upon examination, to support the latest revelations of science.

Dante, in the second canto of the *Paradiso* in his divine comedy, introduces himself to the reader in a novel situation. He is in the moon, and, being there, wisely takes the opportunity to ask his lady, Beatrice, who happens to be with him in that same "first star," a question which has interested mankind at large for many ages, and if ever satisfactorily answered, will be so, probably, by the aid of photography. "What," he says, "are those black marks in the moon, which make the good folk down below on earth to utter their fables about Cain?" (Cain, it will be understood, is the Italian individual equivalent of our generic man in the moon.) The answer of Beatrice is not wholly satisfactory; it is, in fact, American. Her reply involves another question: "What," says she, "do you think of the matter yourself?" Her own explanation is a little too complex and abstruse for the general public; but the photographer will, perhaps, be interested in an optical illustration, which she suggests to Dante, derived from three mirrors placed at certain distances, and illuminated by a light proceeding from behind the experimentalist.

In this matter of the moon the mind is astounded by the marvels seen by intelligent speculation. In the blessing of Joseph a benediction is invoked upon the territory of that patriarch "for the precious things put forth by the moon." What these precious things may be is not precisely clear. An erudite ecclesiastic has supposed them to be those vegetables which require a month to bring them to perfection, but refrains from further enlightening the public about what particular vegetables these are. May not rather these precious things put forth by the moon be the bounteous sheaves of interesting story, the entertaining portraitures, the thousand-and-one fancies of diverse growth, and place, and time, of which none are more celebrated than those which circle about her sole supposed inhabitant, commonly called "The Man in the Moon?"

It is for photography to explain to us who the man in the moon really is. Whether, indeed, the figure which meets our naked eyes be a man at all, and not, rather, a lion, as is the opinion of Albertus, or, as Eusebius prefers, a fox; or a hare, as is maintained by the Singalese; or the soul of a sibyl, as is suggested by Plutarch; or a woman, Mary Magdalene, according to the pretty mediæval legend, which explains the lunar spots by her repentant tears. Let, however, so much be granted that the figure is that of a man. What manner and condition of man must still be told by the camera. Is it, for instance, Luna's lover Endymion? Is it Cain proceeding—oh! how slowly—up the mountain to sacrifice his offering of the fruits of the ground, which had so little respect from his Lord in comparison with the bloody butchery of his brother Abel? Is it that unfortunate wight in Numbers, who, for gathering sticks on the Sabbath day, was stoned with stones till he died, by the congregation of his own fellow-men, including, possibly, his own family circle, as the Lord commanded Moses?

In the elucidation of one particular in the man in the moon's history even photography must be powerless. In Chaucer's "Testament of Creseide," Lady Cynthia, in a grey gown full of black spots, is shown to the reader with a churl painted upon her breast, bearing a bush of thorns on his back, which he is said to have stolen, and for that felony he is transported to the moon, and may climb no nearer heaven. The theft here is the crime, and not the Sabbath breaking, a circumstance which, though it diminishes the disproportion of the punishment, cannot, any more than that sin for which it is a substitute, be distinguished by the camera. To determine this business satisfactorily is the province less of the photographer than of the historian. He it is, also, who must explain the presence of the dog, an intrusive and later feature in the original legend, recognized in Shakespeare's time; for did not Caliban's fair mistress, Miranda, in "The Tempest," show him that dog, in addition to the man and the bush? And in "A Midsummer Night's Dream" the carpenter, Quince, is not satisfied with this, but must needs introduce a lantern in addition. One must come in, he says, with a bush of thorns and a lantern, and say he comes to disfigure or to present the person of Moonshine.

It is in the nature of all legends to grow, as this legend of the man in the moon has grown. Successive narrators imagine successive incidents to give a roundness to their romance. The dog and the lantern were brought into the picture as probable accompaniments of the man, and very likely from some far-off sense of the eternal fitness of things. It remains for the camera to relegate them to their proper situations—anywhere, indeed, except in the moon. Seeing is believing, according to a vulgar proverb, and when people find neither dog, nor lantern, nor thorn bush, nor man in the moon's photograph, they will, perhaps, cease to believe in them, except some few, who may urge that those are all to be discovered on that other side which has never yet been beheld by human eyes. Legend after legend will thus disappear upon comparison with the moon's true portrait. For instance, that of the New Zealanders, who speak of one of themselves in a far back time, a certain Rona, who went by night for water to his well; what time he slipped and fell, and sprained his ankle, he saw the moon falling also rapidly upon him. Then he seized the branch of a tree to protect himself, but the branch broke, and, by some mysterious law of nature or art, left by the New Zealanders unexplained, instead of the moon falling upon him, he fell himself upon the moon, and there remains with the broken bough up to this present. It will be clearly discovered in a photograph of the moon whether this story has any real or apparent, primary or secondary truth.

(*To be continued.*)

## PHOTOGRAPHING IN COLOURS.

The iuventiou which has recently been announced from Paris, of a method of communicating colour to a sensitive photographic film by the action of a ray of coloured light, will, if confirmed, awaken very widespread iuterest, for it is impossible to foresee all the applicatious to which such a discovery might be expected eventually to lend itself. The idea is credited to M. Lippmann, a professor of the Sorbonne, and a physicist whose name is already widely and favourably known in connection with some highly ingenious instruments of physical research. The theory which he is said to have successfully embodied in experiment is that the interference of two rays of light of the same wave length may be caused to produce a characteristic effect upon a sensitive film such as amounts to dyeing the film of the particular hue in question. So far as has at present been explained, the process appears to depend upon the doctrine that the chemical action, like the chromatic properties of a ray of light, is capable of being affected by the conditions which give rise to the phenomena of interference. In itself this seems likely enough. It is well known that if two rays of light having the same wave length travel along the same path simultaneously, they interfere with one another. It may and does happen that at certain points along the path, depending for their position on the wave length, the two impulses tend to counteract, and at other points to reinforce one another. A luminiferous particle—whatever that may be—which is acted upon by two opposing forces will remain at rest if the forces are equal as well as opposite; while if the forces be not equal, or not directly opposed, there will be some resulting disturbance, but still a disturbance different from that which would have been produced by either of the coincident forces acting alone. From this cause arise all those beautiful optical effects of interference which so strikiugly illustrate the undulatory theory of light. Now, if it be a fact that the chemical activity of a ray of light is subject to the same law, and can be either exalted or depressed by causing a second ray of the same wave length to act upon the seusitive reagent, it is quite couceivable that a pair of rays of light might be so directed through a photographic film as to cause, not a uniform, but a sporadic deposit of the precipitated element. These minute deposits would, in that case, be distributed at definite distances apart along the line of the common path of the active rays, because they would mark the points of co-operating and therefore exalted activity. Similarly, their intervals would occupy the spaces in which the antagonism of the two rays had reduced or even destroyed the actinic effect. Now, such a film would apparently be opaque to any light not having this particular wave length, because at some point it would necessarily be absorbed by the opaque deposit. But if a ray of the same wave length impinged, it might be able to pick its way successfully between the deposits. Professor Lippmann is said to have produced such a film by the expedient of placing a mirror at the back of his sensitive plate, and causing the focussed ray to return along its own path. The mirror is produced by making the plate one side of a mercury trough, which, when filled, constitutes a mirror in exactly the desired position. The expedient, if successful, is certainly charmingly simple, and, seeing that the healing art would undoubtedly benefit in as high a degree as any by a practicable system of chromatic photography, we look with lively interest for some further information upon the theory and practice so ingeniously originated.—*The Lancet.*

## A ZINC SULPHIDE COMPOUND SENSITIVE TO LIGHT.*

BY JOHN CAWLEY, ASSOCIATE OF THE ROYAL SCHOOL OF MINES.

Zinc sulphate, or chloride freed from iron, manganese, lead, tin, and so on, is precipitated by an alkaline or alkaline-earthy sulphide; the precipitate, consisting of hydrated zinc sulphide alone, or in admixture with a sulphate of an alkaline earth, is dried and iguited at a red heat; the red-hot product is thrown into water, levigated, washed, dried again, and reduced to fine powder. The pigment is then ready for grinding in oil as a paint.

This process, simple in outline, requires considerable skill and experience to carry it out successfully, but if well carried out it produces a pigment superior to the best white-lead in respect of whiteness, body, and covering power. It is, moreover, relatively innocuous, and is not discoloured by gases containing $SH_2$.

Iu general, however, it is subject to the grave defect of darkening wheu exposed to sunlight, the darkening apparently being due not only to light, but also dependent on the condition of the atmosphere in respect of moisture-contents and other iufluences. I have prepared pigmeuts so sensitive as to be turned almost black when exposed to bright sunlight for one or two minutes. A curious thing to be noted in this connection is that the darkened pigment will completely regain its whiteness when placed in the dark for a few hours, and when so bleached it appears to be somewhat less sensitive than it was originally. It would be too long a story to go into all the details of the experiments made by me in connection with this matter. I will, therefore, content myself by giving a brief account of the more important observations, interpolating here and there remarks of an explanatory character.

1. The dried hydrated zinc sulphide, before ignition, is not altered by exposure to light; after ignition it darkens readily.

2. The whitest and purest zinc blende obtainable was levigated and exposed to light. No darkening was observed, but the same blende calcined, so as to slightly oxidise it, was readily darkened.

3. Zinc sulphide was prepared in a very finely-divided condition, and freed from hydration by burning zinc in an atmosphere of sulphur vapour, and collecting the product in a chamber the temperature of which was high enough to prevent the condensation of sulphur. This sulphide was unchanged by light, but, like the blende, darkened readily after slight calcination.

In connection with the observations above-named, I may say I had been struck by the resemblance which the colour developed in the pigmeut by light bore to that of the finely-divided metal deposited from certaiu metallic solutions.

Noting that the pigment moistened with water was more sensitive than when in a dry condition, a sample was dried at 120° C., and while warm was placed in a glass tube, which was sealed before the blowpipe. Result, no discolouration after one year's exposure. A sample placed in a sealed tube without extra drying was readily darkened.

Taking a sample of pigment not very sensitive, *per se*, it was uoted that its sensitiveness was enormously increased by moistening it with a weak solution of zinc sulphate, from which it was inferred that the sensitiveness might be due to imperfect washing. The most thorough washing, however, would not remove the basic zinc sulphate formed in the process of ignition.

Attempts were made to decompose this basic sulphate into zinc oxide and an inert sulphate by treating the pigment with solutions of the hydrates of potassium, sodium, bariuu, and calcium; the first three were rejected, as they appeared to act on the zinc sulphide itself. Lime-water exercised for a short time a decidedly protective effect; afterwards it seemed to lose its power of making the pigment resistant to light.

Brixton and Clapham Camera Club.—The proceedings ou the 21st inst. included a limelight lantern display, discussion of the proposal in favour of cheap fares for photographers, and a flash-light demonstration.

* Abridged from last week's *Chemical News.*

## PHOTOGRAPHIC SHUTTERS.*

BY FRANCIS BLAKE.

At the outset, I will say that the word "shutter" will be used throughout this paper, not because I deem it a correct name for the apparatus, but because more than thirty years of bad usage have so fixed it in the photographic vocabulary that it would be quixotic to try to displace it. Of course, "opener" would be quite as appropriate—or, rather, inappropriate—a name as "shutter"; and, of course, "exposer" is the proper substitute for both, as its dictionary meaning defines precisely the function of the apparatus.

The earliest mention of shutters with which I am familiar is in a most excellent dictionary of photography, edited by Thomas Sutton, and published at London in 1867. On page 156, under the heading of "Instantaneous Shutters," he says:—"There are many methods of instantaneously admitting and shutting off the light from the sensitive plate. Mr. Wilson, who has been most successful in getting good pictures with rapid exposures, adroitly uses his Highland bonnet placed in front of the lens. Some use flap-shutters in front of the lens; some a similar arrangement close behind the lens; and Mr. England and others use a guillotine sort of shutter with a slot cut across it, which falls immediately in front of the sensitive plate. As the slot passes the plate, the parts thus exposed to light receive the full effect of the whole power of the lens. In some respects this is the best instantaneous shutter that has yet been devised; but it is apt to cause a vibration in the camera while in the act of falling." I have quoted the above because I feel sure that later on you will share with me surprise that the principle of the focal plane shutter, so clearly stated by Sutton, should have been entirely neglected by later workers in the photographic field.

Before beginning original work, it was thought best to test the speeds of the best market shutters. This was done by means of an apparatus which I devised, and had the pleasure of exhibiting to the Boston Camera Club some years ago. The principle of the apparatus is simply photographing the image of the sun as reflected by a freely falling silvered ball, and deducing the time of exposure by applying a law of gravitation to the linear value of the distorted image.

My apparatus consists of a vertical staff, about six feet in height, rigidly attached to an iron bed-plate. The staff is painted dead black, and is graduated downwards, on its front face, in white lines to feet and hundredths. At the top of staff is a movable piece readily adjusted to the height which brings the image of the sun, as seen upon the surface of the ball, exactly in line with the zero of the staff graduation. The silvered brass ball, $2\frac{3}{8}$ inches in diameter, and 2 lbs. 2 ozs. in weight, is suspended by a short piece of silk trant-line attached to a small vulcanite ring, which, in turn, is held by a spring-clip attached to the adjusting piece. On opening this spring-clip the ball is released, and, falling parallel to the graduated staff, is received into a padded box attached to the bed-plate.

It is perhaps needless to say that the exposure is made while the ball is falling, and that the length of the exposure is computed from the scale readings of the beginning and end of the black line which marks on the negative the path of the reflected image of the sun.

To facilitate the computation of results, I have prepared the subjoined table, which gives the time of falling to the ten-thousandth part of a second for each hundredth of a foot from 1·00 foot to 5·59 feet. The formula used in computing this table is that $t = \sqrt{\frac{d}{g}}$ when $t =$ time; $d =$ distance fallen; and $g = 16{\cdot}083$ feet—the gravity constant at our latitude. The manner of using the table will be made apparent by the following example:—An exposure having been made with a Prosch duplex shutter, the beginning of the black line marking the course of the sun's image on the negative was found to be opposite the 4·62 feet staff graduation, and its end opposite the 4·29 feet graduation. Referring to the table, it appears that—

| | | ft. | | s. |
|---|---|---|---|---|
| Time of falling | ... ... | 4·02 | = | 0·5000 |
| " " | ... ... | 4·29 | = | 0·5165 |
| | Time of exposure | | = | 0·0165 |

With a well-made shutter the accordance of the results obtained with this apparatus is remarkable. For example, three consecutive tests for fastest speed of a Prosch duplex shutter gave the following values:—

| | | s. |
|---|---|---|
| 1st test | ... ... ... ... ... | 0·0164 |
| 2nd " | ... ... ... ... ... | 0·0167 |
| 3rd " | ... ... ... ... ... | 0·0179 |
| | Mean | 0·0170 |

Each test brought into play a different part of the staff graduation.

TABLE GIVING THE TIME IN TEN THOUSANDTHS OF A SECOND FOR EACH HUNDREDTH OF A FOOT, FOR A FALLING BODY AT LATITUDE 42° 2).

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1·0 | 2491 | 2506 | 2518 | 2531 | 2543 | 2555 | 2567 | 2579 | 2592 | 2603 |
| 1·1 | 2615 | 2627 | 2639 | 2651 | 2663 | 2674 | 2686 | 2697 | 2709 | 2720 |
| 1·2 | 2732 | 2743 | 2751 | 2766 | 2777 | 2788 | 2799 | 2810 | 2821 | 2832 |
| 1·3 | 2843 | 2854 | 2865 | 2876 | 2887 | 2897 | 2908 | 2919 | 2929 | 2940 |
| 1·4 | 2951 | 2961 | 2972 | 2982 | 2992 | 3003 | 3013 | 3023 | 3031 | 3044 |
| 1·5 | 3051 | 3061 | 3071 | 3085 | 3095 | 3105 | 3115 | 3125 | 3135 | 3144 |
| 1·6 | 3154 | 3 61 | 3174 | 3184 | 3193 | 3203 | 3213 | 3223 | 3232 | 3212 |
| 1·7 | 3251 | 3261 | 3270 | 3280 | 3289 | 3299 | 3308 | 3318 | 3327 | 3336 |
| 1·8 | 3316 | 3355 | 3364 | 3373 | 3383 | 3392 | 3401 | 3110 | 3119 | 3428 |
| 1·9 | 3137 | 3416 | 3155 | 3164 | 3173 | 3482 | 3491 | 3500 | 3509 | 3518 |
| 2·0 | 8527 | 3535 | 3541 | 3553 | 3562 | 3570 | 3579 | 3588 | 3596 | 3605 |
| 2·1 | 3611 | 3622 | 3631 | 3639 | 3648 | 3656 | 3665 | 3673 | 3682 | 3690 |
| 2·2 | 3699 | 3707 | 37 6 | 3724 | 3732 | 3741 | 3749 | 3757 | 3765 | 3774 |
| 2·3 | 3782 | 3790 | 3798 | 3806 | 3815 | 3823 | 3831 | 3839 | 3817 | 3855 |
| 2·4 | 3863 | 3871 | 3879 | 3887 | 3895 | 3903 | 3911 | 3919 | 3927 | 3935 |
| 2·5 | 3943 | 3951 | 3959 | 3966 | 3974 | 3982 | 3990 | 3998 | 4005 | 4013 |
| 2·6 | 4021 | 4029 | 4036 | 4044 | 4052 | 4059 | 4067 | 4075 | 4082 | 4090 |
| 2·7 | 4098 | 4105 | 4113 | 4120 | 4128 | 4135 | 4143 | 4150 | 4158 | 4165 |
| 2·8 | 4173 | 4180 | 4188 | 4195 | 4202 | 4210 | 4217 | 4225 | 4232 | 4239 |
| 2·9 | 4247 | 4254 | 1261 | 4269 | 4276 | 4283 | 4290 | 4298 | 4305 | 4312 |
| 3·0 | 4319 | 4326 | 4334 | 4311 | 4348 | 4355 | 4362 | 4369 | 4376 | 4383 |
| 3·1 | 4391 | 4398 | 4405 | 4412 | 4119 | 4426 | 4433 | 4110 | 4447 | 4454 |
| 3·2 | 4161 | 4468 | 4475 | 4482 | 4189 | 4196 | 4502 | 4509 | 4516 | 4523 |
| 3·3 | 4530 | 4537 | 4541 | 4551 | 4557 | 4561 | 4571 | 4578 | 4585 | 4591 |
| 3·4 | 4598 | 4605 | 4612 | 4618 | 4625 | 4632 | 4639 | 4615 | 4652 | 4659 |
| 3·5 | 4665 | 4672 | 4679 | 4685 | 4692 | 4698 | 4705 | 4712 | 4718 | 4725 |
| 3·6 | 4731 | 4738 | 4745 | 4751 | 4758 | 4764 | 4771 | 4777 | 4784 | 4790 |
| 3·7 | 4797 | 4803 | 4810 | 4816 | 4823 | 4829 | 4835 | 4842 | 4848 | 4855 |
| 3·8 | 4861 | 4867 | 4874 | 4880 | 4887 | 4893 | 4899 | 4906 | 4912 | 4918 |
| 3·9 | 4925 | 4931 | 4937 | 4911 | 4950 | 4956 | 4962 | 4968 | 4975 | 4981 |
| 4·0 | 4987 | 4991 | 5000 | 5006 | 5012 | 5018 | 5025 | 5031 | 5037 | 5013 |
| 4·1 | 5049 | 5055 | 5062 | 5068 | 5074 | 5080 | 5086 | 5092 | 5098 | 5104 |
| 4·2 | 5111 | 5117 | 5123 | 5129 | 5135 | 5141 | 5147 | 5153 | 5159 | 5165 |
| 4.3 | 5171 | 5177 | 5183 | 5189 | 5195 | 5201 | 5207 | 5213 | 5219 | 5225 |
| 4·4 | 5231 | 5237 | 5243 | 5219 | 5255 | 5260 | 5266 | 5272 | 5278 | 5281 |
| 4·5 | 5290 | 5296 | 5302 | 5308 | 5313 | 5319 | 5325 | 5331 | 5337 | 5343 |
| 4·6 | 5348 | 5354 | 5360 | 5366 | 5372 | 5377 | 5383 | 5389 | 5395 | 5100 |
| 4·7 | 5406 | 5412 | 5418 | 5423 | 5129 | 5435 | 5441 | 5146 | 5452 | 5158 |
| 4·8 | 5163 | 5469 | 5475 | 5180 | 5486 | 5192 | 5497 | 5503 | 5509 | 5514 |
| 4·9 | 5520 | 5526 | 5531 | 5537 | 5512 | 5548 | 5554 | 5559 | 5565 | 5570 |
| 5·0 | 5576 | 5582 | 5587 | 5593 | 5598 | 5601 | 5609 | 5615 | 5620 | 5626 |
| 5·1 | 5632 | 5637 | 5643 | 5648 | 5651 | 5659 | 5665 | 5670 | 5676 | 5681 |
| 5·2 | 5686 | 5692 | 5697 | 5703 | 5708 | 5711 | 5719 | 5725 | 5730 | 5735 |
| 5·3 | 5741 | 5746 | 5752 | 5757 | 5763 | 5768 | 5773 | 5779 | 5784 | 5789 |
| 5·1 | 5795 | 5800 | 5806 | 5811 | 5816 | 5822 | 5827 | 5832 | 5838 | 5813 |
| 5·5 | 5818 | 5854 | 5859 | 5864 | 5869 | 5875 | 5880 | 5885 | 5891 | 5896 |

*(To be continued.)*

* Paper read before the Boston Camera Club.

## Notes.

Mr. B. Harvey, in his letter from Kimberley last week, said in one line that the quagga is not extinct, and in another line that he "believes" it not to be extinct. Since then we have had a letter from him, in which he says that he has written to all the newspapers in the Eastern Province of South Africa, to learn whether quaggas still exist. He also entertains the ambitious idea of capturing one and sending it to Mr. Bartlett, the Superintendent of the Zoological Gardens, if anyone will pay expenses. If this animal—Beast, Mr. Harvey impolitely calls it, with a capital B—be not yet extinct, and the discussion which has arisen over the photographic frontispiece to the last Year-Book shall have been the means of the saving it, photography will have rendered one great service to zoology and to the world, and its votaries ought to keep a tame or wild quagga in memory thereof. Mr. Harvey might do worse than to send one live quagga to the Camera Club and another to the Photographic Society, to be kept as trophies on their new premises; a third might be sent to Messrs. York and Son. It is to be hoped that he will not ship striped jackasses of the wrong kind in mistake, so he cannot do better than to make all zoological or other suitable scientific societies in South Africa aware of the interest the subject has created in this country, and to get them to give the weight of their authority as to the existence or non-existence of the genuine quagga.

The Count d'Assche sends us from Paris a copy of *La Liberté*, containing a long description of Professor Lippmann's discoveries in heliochromy, but nothing more than has been already published in these pages. The writer of the article, however, called upon M. Nadar, and asked his opinion, as a professional photographer, upon the subject. The latter replied that it was an elegant and ingenious discovery, but not yet within the range of ordinary photographic work, chiefly because of the length of exposure, which, with plates of the sensitiveness at present employed by M. Lippmann, varies from a half to two hours. M. Nadar gave his literary visitor much information about efforts to solve this problem in the past, and described to him the curious process with glasses of three colours which Ducos du Hauron and Charles Cros communicated more than forty years ago to the Academy of Sciences at almost the same time, and in almost the same words.

Dr. Janssen, the president of the Permanent Committee of the International Photographic Congress, has written a letter, which appears in the last number of the *Bulletin Belge*, setting forth that the next meeting of the Congress will be held in Brussels during the second fortnight in August next. The Committee asks the president of the Belgian Photographic Association to suggest subjects for inclusion in the programme of the next Congress. All communications about the Congress, Dr. Janssen says, should be addressed to M. S. Pector, General Secretary, 9, Rue Lincoln, Paris. We do not know to whom in Brussels letters should be addressed on the subject; beyond printing M. Janssen's letter the *Bulletin* is silent on the subject. There is no doubt that if the Belgians think well to give a warm reception to the Congress, they will do it in a thorough manner. In the past we have seen much of their hospitality in this respect at Antwerp and other places.

Photographers, like others, have had their share of troubles from the bursting of water pipes by frost during the late severe weather, and this has often interfered with work in the developing room. The remedy is to use oval instead of round water pipes, and such pipes are in the market. On freezing, water expands instead of contracts, and this bursts the pipes; the force exerted is enormous; indeed, it was a favourite experiment by Professor Tyndall at the Royal Institution to burst bomb-shells by the freezing of water in their interiors. Water in freezing renders the bore of an oval pipe more circular, and as the latter has a larger capacity than the oval form, the strain upon the metal is less than with ordinary pipes.

Mr. Isaac Roberts, who has done so much valuable work in the field of astronomical photography, has contributed to the monthly notices of the Royal Astronomical Society a note on "Photographic evidence of Variability in the Nucleus of the great Nebula in Andromeda." It seems that, during the past six years, a large number of negatives were taken of this nebula, the exposures varying from five to sixty minutes. In some of these the nucleus of the nebula seems to have a decidedly stellar appearance, but in others quite a different appearance is recorded. Mr. Roberts infers from these different results in his photographic plates that the nucleus is variable.

Another astronomical note which should be interesting to photographers comes from Mr. Barnard, of the Lick Observatory, "On the Nebulosities of the Pleiades, and on a new *Merope* Nebula." In November last Mr. Barnard, while examining the Pleiades, discovered a new and bright cometary nebula close south, and following *Merope*. This nebula has been constantly observed since that occasion, and its position has been determined, but it has not yet been photographed, owing to the fact that the long exposure required for the nebula would over-expose *Merope* to such an extent that the luminosity of the two would coalesce.

We lately alluded to the bursting of a pressure gauge which was used in conjunction with a gas cylinder, and which, unfortunately, led to the serious injury of the person who happened to be handling it. Another accident of the same kind, but unattended by injury to anyone, has since been reported, and Mr. F. J. Smith, of Trinity College, Oxford, has sent some interesting particulars of the occurrence to *Nature*. The gauge was fixed upon an oxygen cylinder, and, from the fused appearance of the various fragments of metal and glass which resulted from its disruption, it is believed that, by some means, great heat must have been generated. Possibly this was akin to the air friction which causes a meteor, in its passage through our atmosphere, to become white hot. It seems certain that the accident could not have been brought about by any admixture of the oxygen with hydrogen, for we are told that a blow-through jet was in use at the time. It is not, however, stated whether the same guage had not been employed a few minutes before to record the pressure in a cylinder of hydrogen.

---

Messrs. Newton and Co., of Fleet Street, in commenting upon this occurrence, point out that such accidents must occasionally occur as gauges wear out—not a very comforting piece of information for lime-light workers; but they also give some valuable hints whereby danger from such accidents may be reduced to a minimum. This is what they say:—"There should be no cast iron in the gauge; the tubes and works should be mounted on a brass or gunmetal frame. The glass covering the dial should be mounted in a ring, fitting on the body of the gauge like a cap. When the gauge is in use this cap should be removed, thus avoiding all danger from the broken pieces of glass. The gauge should then be closed in a brass wire cage, so that should the tube burst, any portions of metal would be caught by the wire network, and if not stopped altogether, would, at any rate, be rendered harmless."

---

Mr. Fowler, a member of the Royal Astronomical Society, who thought he had discovered that *a* Lyræ was a double star, has not yet got rid of the trouble in which the alleged discovery has involved him. The duplicity was revealed to Mr. Fowler by means of a photograph in which the lines of the star were doubled, and he forthwith read a paper on the subject at the Society. Unfortunately for Mr. Fowler, Professor Vogel, of the Potsdam University, and the Brothers Henry at Paris, had also photographed this particular star, and not a trace of duplicity could they discover; whereupon Mr. Fowler had to own that his conclusions, owing to some cause which he could not determine, must have been erroneous. At the last meeting of the Astronomical Society a paper by Professor Vogel was read, in which he went fully into the matter, and showed that not only must Mr. Fowler's photographs have been erroneous, but that his calculations were also wrong. Mr. Fowler's answer to this was looked forward to with much interest; but all he could say was that he felt bound to acknowledge that *a* Lyræ was not a double star, and that he had no explanation to offer as to the discrepancy between his photographic observations and those of Professor Vogel.

---

Mr. Fowler had a sufficient reason for his inability to offer an explanation of the differences in the fact that the weather since November had been so bad that he had not been able to obtain any photographs, or to test the adjustments of his photographic instruments; but he was not so happy in his explanation as to the inaccuracies in the calculations; indeed, he said nothing at all on the matter until Capt. Noble drew attention to it and enquired, drily, whether they used Walkingham's arithmetic at South Kensington, or whether they calculated according to Cocker there, as the discrepancy was very great. Mr. Fowler, in reply, said that he worked out his figures by the graphical method, and laid no claim to great accuracy, also that it now remained for him to determine why the doubling of the lines was special to the instrument he employed; and so the matter remains. The moral of the incident is, that photographic observations are made up of so many elements that it is unsafe to rely upon any single result until it has been verified by repeated experiments. The alleged doubling of *a* Lyræ bids fair to be a precedent which astronomical photographers will do well to bear in mind.

---

Mrs. French Sheldon, the adventurous woman who is to put Stanley in the shade, has extensive views of photography. She lately told an interviewer that she takes with her eight or nine cameras, so as not to be beaten if the one or other fails her. If Mrs. Sheldon is similarly prudent in regard to other requirements, what an amount of baggage she will have! By the way, it is to be hoped that she is a little more thorough with regard to photography than she is as to astronomy. One of the studies which interests her, and which she hopes to make, is that of the constellations only seen in the southern skies; but she has had no time to take lessons in astronomical science, and contents herself with a few hints from Mrs. Richard Proctor. If Mrs. Sheldon has only had time to get a few "hints" in photographic manipulation, her eight or nine cameras may prove a thorn and a burden. Photography—like beer, which, according to Mr. Richard Swiveller, cannot be tasted in a sip—cannot be mastered by a hint.

---

According to a report of the latest edition of Mr. Muybridge's lecture on the movements of the horse, his opinion is that photography is an especial help to artists in assisting them to have a larger knowledge of nature in movement. His theory is that the ungraceful attitudes of animals need not be represented, but, at the same time, care should be taken not to fall into faults which, without hurting the eye, yet are not true to nature. This is just where the difficulty comes in. The artist—that is to say, the artist of the conventional school—is at one end of the scale, and Mr. Muybridge with his instantaneous photographs is at the other. The question is how the two extremes are to meet. Up to the present the subject has not been fully dealt with in the spirit of compromise. What is wanted is the happy medium which, while not losing sight of what may be termed the grace of art, yet imparts the spirit of nature as represented by instantaneous photography.

## PHOTOGRAPHIC TOURISTS IN ICELAND.*

BY J. REYNOLDS, M.D., F.R.G.S.

*Slide* 17.—We were now to have our first experience of lava fields and earthquake cracks; for a little while the road was very fair, but about four or five miles from the capital the real road or track began, and *such* a road! Imagine, if you can, a ploughed field strewn with huge masses of clinkers, each piece varying from the size of one's head to the size of a house, only a few feet apart, and you have a faint idea of the plains north of Krisuvick. As you approach the volcanic chains near the south coast, words utterly fail to convey an idea of the scene of gloom and wild desolation that presents itself far and wide as far as the eye can reach; nothing but calcined rocks, huge lava boulders, charred branches of shrubs, and disintegrated lava, not a blade of grass nor living thing to be seen. The dead silence, the fire-blasted appearance of the calcined rocks, is appalling; here and there on the edge of the volcanic chain puffs of smoke can be seen curling up from fissures in the ground, showing that the fires are close beneath our feet—in fact, in some places the earth is so hot as to burn our boots—but we go on until we begin to ascend the actual mountains, and now in crossing the chain we pass through and around crater after crater of slumbering, but not extinct volcanoes. We pass along a path fifteen inches wide, on horseback it must be remembered, having on our right steep precipices into the various craters, and on our left perpendicular lava walls, and in some places there is actually a gap of a foot or two in this narrow path, over which our careful little ponies carry us safely—we dare not cross it on foot. We reach the other side, and on descending into the plain below, a sight presents itself which is not easily forgotten. The slide gives a general view. Our guide tells us we had better pitch the tents on the grass, the blades of which are at least six inches apart, and so rank that the ponies will not touch it; and now what a view one beholds! On the sides and in the recesses of the hills are vast pits, or cauldrons, or shallow lakes, all in a state of violent ebullition, so violent as to make the earth around tremble. Jets of steam at very high pressure are escaping with a deafening roar, clouding everything, and smelling horribly of rotten eggs. Every little hole that one makes in the ground with a stick sends up a curling column of smoke. One feels that one is merely standing on a thin crust over a fiery furnace miles and miles in diameter, and such is really most probably the case. I must not omit to add that the ground in places is most brilliantly covered with a deep cardinal red, and in others with rich sulphur yellow powder, whilst the milk white edges of the lakes are tinted in alternate bands of every imaginable variety of colour, and when the sun fairly lights up this region, the total effect is a hazy purple, like the bloom on a hot-house grape.

*Slide* 18 gives a nearer view of one or two of these pits.

*Slide* 19 shows five of these pits, including the famous blue mud cauldron, where there is thin mud of a magnificent turquoise blue colour boiling with such violence that the bubbles are thrown up seven or eight feet high. We none of us ventured too near this terrible pit, for it made the firmest of us feel shaky.

*Slide* 20.—One of our party is here shown heating a kettle in one of the boiling lakes.

Having photographed everything of interest in this region of calcined rocks, we started at twelve o'clock next day, Monday, for Vogsasar, a distance of only sixteen miles, but such was the nature of the region we had to pass over that we were nearly eleven hours on the journey; this is said by competent guides, who know all about the Icelandic passes, to be the roughest road in the country. It appears that, at some period, a tremendous eruption of liquid lava from some dozens of craters, which can still be seen, occurred, which liquid flow, in solidifying, cemented together the huge blocks with which this place is literally covered, and that a subsequent earthquake rent this immense coating of cement, and heaped slabs of it, boulders and all, one on top of the other. The lava rocks also here show unmistakable signs of being torn asunder while in a semi-plastic state, and stand out like the fingers of an outstretched hand in their weirdness, awful to look at. We arrived at last at Vogsasar.

*Slide* 21 shows the appearance of the farm, and the beautiful lake Hlivarvatn.

*Slide* 22 shows the farm on a nearer view.

*Slide* 23 shows the sheep-house, with walls four feet thick, to protect from the intense cold of the Icelandic winter.

*Slide* 24 shows our camp beside the lake Hlivarvatn.

The next day (Tuesday) we started at 11·30 a.m. for Eyrarbakki, and arrived there at 7 p.m., crossing on our way the Olfusa river in a ferry boat, after which we walked three miles knee deep in loose volcanic sand, along the banks of the river to the house of Mr. Le Folli, in whose back garden we had obtained leave to pitch our tents.

*Slide* 25 shows our tent in Mr. Le Folli's garden. This slide was given me by R. Marsden, Esq., of Denbigh Castle, one of our party.

*Slide* 26 shows the main street in Eyrarbakki as seen from the sea shore.

*Slide* 27 shows side street in the town.

*Slide* 28 shows an Icelandic fisherman and family group in front of a house on the sea shore.

The next day, at 3.50 p.m., we started for Sandholaferja, where we arrived at 9.15 p.m., crossing the Thjorsa river on our way, and, passing the village farm Lopstadr, we stopped and had some skyr. We also passed and stopped at a farm called Sraun.

*Slide* 29 shows this farm.

*Slide* 30 shows us having lunch on the road to Heckla. From this place we had a splendid view of the mountain, being not more than twenty-three miles distant.

At 11.35 the next morning we started for Heckla, and, after a nine hours' ride over a fair road and horrible bog, into which one of our party got thrown, we arrived at Daltarlakr farm, about five miles from the mountain, having crossed the Rauvilloku river about twenty times. The next slides (31 and 32) were given me by Mr. Lange.

*Slide* 31 gives an idea how the cavalcade looked when crossing this river, which winds like a snake.

*Slide* 32 shows the peculiar lumpy state of the fields about six miles from Heckla, with the guide in the foreground pointing to the mountain in the distance.

*Slide* 33 shows the actual mountain as seen from our camp at Daltarlakr Farm.

The next morning, July 11th, three of our party—viz., Mr. Paul Lange, Dr. Irwin, and I—started to ascend Heckla, and, after seven hours' hard climbing, we entered the crater. Mr. Lange, having a hand-camera in his possession, photographed the said crater, with Dr. Irwin, myself, and the guide standing in the same.

*Slide* 34 shows us as having arrived at the first patch of snow during our ascent, about 1,500 feet up the mountain.

*Slide* 35 shows Dr. Irwin and myself picking up fragments of lava from the wall of the crater, specimens of which I can show you after the lecture.

*Slide* 36 shows chief guide, Dr. Irwin, and myself in crater. I must mention here that Mr. Paul Lange took these two photographs, and kindly furnished me with the slide from the same. He is the first man who has photographed Heckla's Crater. We only took four hours in descending, so much easier is it to go down hill than up.

The tracks to and from the summit lead through mountain torrents and lava flows of the wildest description, and one can see from the summit over a radius of at least seventy miles; in every direction the view is magnificent. Before leaving the farm, the friendly people came to the camp to bid us good-bye.

*Slide* 37 shows one of our party taking an affectionate farewell of the Icelandic ladies.

*Slide* 38.—The next morning, at 10·30, we started for Hruni *en route* for Gullfoss; soon after leaving Heckla, we crossed the Thjorsa a second time, and I took a view of ponies crossing.

*(To be continued.)*

* Continued from page 82.

## HELIOCHROMIC RESEARCHES.

M. Gaston Tissandier, the author of several books upon photography, has visited M. Lippmann, seen his results, and written about them in *La Nature*. He says that M. Lippmann has opened a brilliant outlook to experimenters, that the results will be fruitful, and that what has been done assures a brilliant future for photography in colours. He also describes the built-up mercury trough used by M. Lippmann, as represented in fig. 1. In this cut, G, No. 1, is the sensitive plate, actual size, with its film side in contact with the mercury, M. in the trough. C is a U-shaped length of india-rubber, rectangular in section. F is a small piece of glass to form the back of the trough. The whole system is held together by four strong clips, three of which are depicted in the cut. No. 2, fig. 1,

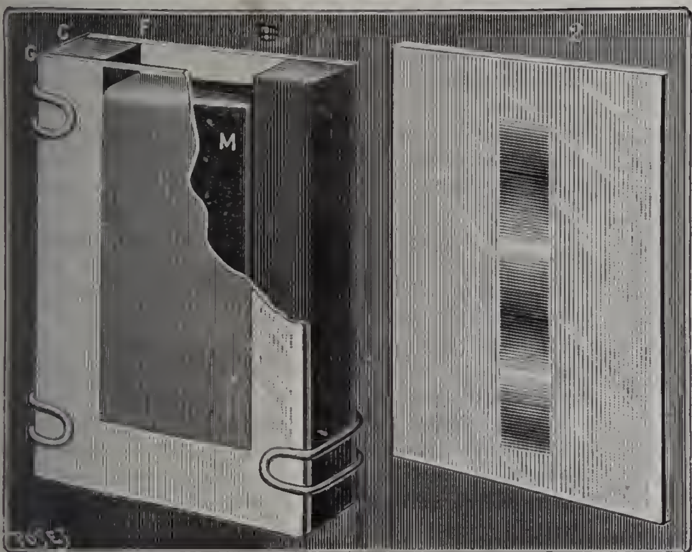



*Fig.* 1.

represents one of the plates with a spectrum photographed on its surface.

Fig. 2 is a diagram from *La Nature* representing the sensitive film considerably amplified, with its glass support on its right-hand side, and the mercury backing on the extreme left; the image is necessarily photographed through the glass. M. Tissandier remarks that near the

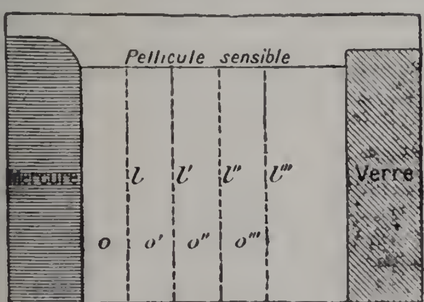



*Fig.* 2.

mercury, and near the adjacent surface of the sensitive film, there is a destruction of light at $o$; farther on, on the contrary, in $l$, the two waves coincide, and there is a maximum of light; farther on again, there is a new destruction of light at $o'$; farther still, at $l'$, another luminous maximum, and so on. The layers of silver in the film are of almost infinite thinness, being 00·00020 millimetres for the violet, 00·00025 for the yellow, and 00·00030 for the red.

At present, while using slow plates, not orthochromatic, the times of exposure given by M. Lippmann vary from half-an-hour to two hours, the latter being necessary at present when it is desired to photograph the red rays.

## PHOTOGRAPHY IN THE ORDNANCE OFFICE.*

In the discussion which followed the paper by Sir Charles Wilson, published in these pages last week—

General A. de C. Scott said that all new processes were more or less built up by the efforts of numbers, and that was so in the present case. Photolithography and photozincography were in part due to men like Mr. Pouncey, who discovered the use of bichromates in connection with pigments; Niepce, who had a process with bitumen; Asser, who used bichromated paper, which was rolled up and used something like a lithograph stone; and Appel, who showed that any print in fatty ink could be transferred to stone. His own particular process involved a change in the methods which had been employed, resulting in producing a transfer which could be applied to any metal surface, and be printed from zinc. That proved successful, and when he left the Survey the results were so far satisfactory. On looking round the room, however, he hardly recognised the process he had left, so much had been done to enlarge and improve it, and he could not sufficiently express his admiration of the success which had followed the efforts of those who succeeded him. He believed they were indebted to General Cooke for those very large photographs, and he remembered when it was considered doubtful whether a lens could be produced which would give such impressions without distortion, which, of course, would render the whole thing useless. Ultimately, however, with the aid of an eminent optician, Mr. Dallmeyer, a lens was produced which succeeded.

Sir H. Trueman Wood could also bear testimony to the value of the scientific work done by the Ordnance Survey Department. Everyone interested in the progress of photography knew how much that science owed to the work done by that department. The photographic work was carried on on a scale which could be seen nowhere else in this country, at any rate. The enormous negative now shown was a most magnificent piece of photographic work, and the regular production of such negatives must involve great difficulties. Photolithography and photozincography also owed a great deal to the Ordnance Department. Photozincography was really invented and perfected there, and great credit was due to the various officials, from the time of Sir Henry James down to the present, for the way in which they had adapted and improved the various processes placed at their disposal. He could not understand why the smaller maps were not produced by a photographic process, which would do in six or eight months what took as many years by the more ornamental but not more useful work of the engraver.

The Chairman, the Attorney-General, said that they were much indebted to Sir Charles Wilson for this paper, but he should have been glad if he had given a little information with regard to the difficulties connected with the actual survey work.

Sir Charles Wilson said that the question of expediting the publication by means of photography had been thought over, but it was considered that engraving was so much superior, and the time was so near when the whole work could be published in that form, that it was not worth while to issue a few sheets

* Abridged from the *Journal of the Society of Arts*.

in photozincography. The new map of London would not be an engraved map, or few present would live to see it completed; it was proposed to publish it by photozincography. This would be a great test of the process, because the portions already issued were so splendidly drawn and engraved. He had recently had a specimen sheet done, and the result was extremely good; the lines were quite as fine as the engraving. The map would be published as each sheet was drawn, and he hoped it would come out in a reasonable time. The map of Scotland on the wall had been produced by photozincography from the large scale map. Its engraving would have taken a very long time, but the whole map had been produced a good deal under twelve months, giving all the details required.

## THE HISTORY OF PHOTOGRAPHY.*

BY DR. J. M. EDER, DIRECTOR OF THE IMPERIAL INSTITUTE FOR INSTRUCTION AND RESEARCH IN PHOTOGRAPHY AND REPRODUCTIVE PROCESSES IN VIENNA.

Beginning with the first chapter of Schiendl's "History of Photography," entitled, "Knowledge of the Action of Light and of Optics in Ancient Times," I notice that this, as well as Chapters II. and III., are really taken from my "History of Photochemistry," a portion of which appeared in the *Photographische Correspondenz* of 1881.† Herr Schiendl only in two cases mentions my work as the source of information; these are with reference to Fabricius and Schultze. He does not do so with regard to Eudoxia, Hellot, Beccarius, Bergmann, Senebier, &c. He also omits to mention that I had found a predecessor of Niepce, viz., Hagelman, and that I had pointed out Berthollet as the discoverer of the first chemical photometer. I consider it necessary to put it thus clearly that this historian makes use of my researches without acknowledging their source.

It is farther interesting to remark that Herr Schiendl's "History of Photography" is interrupted just where my older fragment of the history of photochemistry breaks off, that is to say, from the beginning of the nineteenth century to the time of Daguerre. Thus it happens, for instance, that Schiendl gives a bare history of the photochemistry of chloride of silver (which is described in my earlier fragment), but says nothing of the—at the least as important—history of iodide and bromide of silver, although it is these alone that are applicable to the camera-obscura.

Also the recognition of the true discoverer of the sensitiveness to light of the chromic salts with organic substances‡ (in the absence of silver), which was wanting in my earlier fragment, is also wanting in Schiendl.

Having shown that Herr Schiendl, for the first three chapters of his work, has very *freely* drawn upon my historical work, with very *scanty* acknowledgment of the source of his information, let us take in hand another chapter of Schiendl's history referring to a later period of photography.

Herr Schiendl gives a very different history of photography with chromium salts from that to be found in other authors. He ascribes herein a notable rôle to Ponton and Vauquelin, and displaces and distorts priority. Let us see how Schiendl's account will bear criticism. It is known that I first recognised that Vauquelin discovered that sensitiveness to light of chromate of silver (*Photo. Correspondenz*, 1881, p. 145; also "Eder's History," 1891, p. 51), on which I observed: "The discovery of the sensitiveness to light of the first chromic compounds belongs to Vauquelin. It therefore appears unjust to ascribe the whole of the credit of the discovery of photography with chromic compounds to Ponton alone."

This view of mine Schiendl copies with an alteration of wording. He writes, page 17: "This discovery of Vauquelin's appears to be the foundation of all later publications (for instance, Ponton's) on the sensitiveness to light of chromium salts." With regard to the above-cited quotation, it should be read in connection with what Herr Schiendl writes on page 89 of his "History": "When the services of Ponton are depreciated (see Eder's History), we (E. Schiendl) must observe that Mungo Ponton's work was quite independent." Hereto I remark, in the first place, that I have not sought to depreciate the services of Mungo Ponton to photography, as would be inferred from the foregoing observation; in the second place, Herr Schiendl himself, on page 17, adopts my view, which pleases me much; in the third place, the author contradicts himself again on page 89 of his book. The author thus, in two different parts of his work, puts forth views conflicting with each other. To which of these views of the "Historical Writer" must the reader adhere—the one on page 17, or the one on page 89 of "Schiendl's History"?

In the first he holds that Vauquelin's discovery was the foundation of Ponton's discovery; in the latter he contradicts himself, and says that it was not so, but that this view depreciates Ponton's services, for Ponton has worked quite independently.

Ponton himself, moreover, distinguished the difference in favour of Herr Schiendl's view on page 17* *against* Herr Schiendl on page 89, for Ponton himself says expressly that he had begun his researches with *chromate of silver*, and from this we may conclude that he based his work directly on Vauquelin's.

Still more reprehensible is the manner in which Herr Schiendl treats of the farther development of photographic methods by means of bichromate of potash, for this part of his "History" rests on a remarkable error on his part, such as the writer of a history should by no means commit. Herr Schiendl writes on page 89 of his "History": "Mungo Ponton studied these salts (chromates) with exactitude, and discovered that they, especially the bichromates, were *decomposed in the presence of organic substances by light. The chemical change is such that the solubility as well as the stickiness of the compound is lost*, and, according to the amount of the action of light, *the power to absorb water is either partly or entirely lost.*"

(*To be continued.*)

* A critical examination of "Schiendl's Geschichte der Photographie," 1891, published by Hartleben.

† This part of the work is somewhat scattered. It will be found, however, in my complete "History of Photographie and Photochemie," published some months since (vol. i., "Ausfuhrliches Handbuch der Photographie," Halle), to which anyone may refer.

‡ Suckow, as I found later on. See Eder's *Geschichte*, 1891, page 94.

* That is the place where Schiendl copies from my "History of Photochemistry."—Eder.

---

A demonstration of lantern slide making and a lecture by Mr. A. R. Dresser has been given at the Fry Manufacturing Company's rooms, which were filled by appreciative listeners.

The London and Provincial Photographic Association.—On March 3rd this Association will give a lantern and musical entertainment, with a brief interlude devoted to a demonstration of some of the phenomena of the polarisation of light. Tickets are obtainable of the secretary. On March 5th a paper on "Pictorial Composition" by Mr. P. H. Newman; March 12th, lantern night; March 19th, a demonstration with gelatino-chloride paper, Mr. J. Howson; March 26th, "High Speed Shutters," Mr. A. S. Newman.

## ALUMINIUM.

BY G. L. ADDENBROOKE.

To all those who take an interest in the brass and glass elements of photography, few things offer a more pleasing and hopeful field for speculation at present than the possibilities which the cheap production of this metal opens out. Great as have been the advances of metallurgy in other directions, they have, during the last few years, been simply astonishing in this.

At the exhibition of 1851, some small bars of aluminium, reduced by the French chemist, Deville, at the cost of Napoleon III., formed one of the rarest and greatest curiosities. From that time the reduction of the metal has always been carried on commercially on a small scale, but until some four years ago the price remained steadily at about seven shillings and sixpence per ounce, while no method of soldering it satisfactorily was known, so that its use was limited to certain parts of scientific instruments, and to the best kinds of opera and field glasses, where its lightness was a sufficient set off against its expense and the difficulties of working it.

The old method of reducing this metal, which forms the chief constituent in clay, and is, therefore, the most abundant metal in nature, consists in acting with metallic sodium on a kind of spar called cryolite, which is a fluoride of aluminium. The cryolite is pounded up and mixed with small pieces of sodium, and the whole brought to a red heat, and kept for some time at this temperature in a closed retort, during which the fluorine combines with the sodium, leaving the aluminium in a metallic state. The price of aluminium made by this process is, therefore, entirely dependent on the price at which the sodium needed for its reduction can be procured. The improvements which have been made in the manufacture of aluminium by what is called the chemical process have chiefly lain in the direction of improved and cheaper methods of reducing the metal sodium. The Castner process is of this kind, and chiefly by its means the price of aluminium was brought down about three years ago from seven shillings and sixpence per ounce to twenty shillings per pound.

But during the past three or four years a third process has been worked out by which, with the aid of electricity, the cost of producing aluminium has still further been reduced. By this process the aluminium is reduced in an electric furnace—that is, one in which the heat is generated by the passage of a current of electricity between two carbon rods, or between a carbon rod and a plumbago crucible. The heat is thus actually generated in the furnace itself in the midst of the materials to be operated on, and is not communicated from outside in the ordinary manner.

The electric process, being a cheaper one to work than the chemical, when first introduced caused a sharp rivalry to spring up between the two, the result being that both processes have been still further perfected, and the price of aluminium is now brought down to eight shillings a pound, while there are prospects of still further considerable reductions.

The price of the metal is now brought to a point which admits of its being employed for numerous purposes where its cost has hitherto been prohibitive. In comparing its price with that of brass, it must be remembered that it is only one-third the weight—the proportions being exactly 2·67 to 8·4—so that, bulk for bulk, a pound of aluminium goes three times as far as a pound of brass; thus, at eight shillings per pound, the cost of aluminium is only about three times that of brass.

Already we have lenses mounted in aluminium, and there is now no reason why tripod heads and some of the other metal parts of cameras should not be made of it. Its use for constructing shutters is obvious. It might advantageously be employed for the framework of dark slides and changing-boxes, and, finally, it would make excellent developing dishes, both light and indestructible. Aluminium has, therefore, a wide and useful field before it in connection with photographic apparatus, while the possibilities of its application in other ways are almost endless.

---

## THE SCIENCE OF COLOUR.

Last Friday Captain W. de W. Abney delivered his second lecture on the above subject at the Society of Arts.

He said that, as a standard light, he always used the most luminous portion of one of the poles of an arc lamp. It was sensibly the same at all times, as might be expected from its being at the temperature of the vaporising point of carbon.

The variations in the brightness of daylight at various altitudes of the sun above the horizon had been much worked at experimentally by Professor Tyndall, and Lord Rayleigh had worked out the law. Much of the variation is due to small particles floating in the atmosphere, and there are differences of opinion as to the nature of those particles. He (Captain Abney) believes them to be chiefly small floating particles of water. Such particles will float for a long time if small enough; in fact, Stokes has proved that some of them do not fall more than one-tenth of an inch in an hour; coarser particles may sink as much as one foot in an hour. Lord Rayleigh says that the small particles in the air can discriminate between the waves of ether, and absorb some more than others. The lower the sun is on the horizon, through the more of these particles does its light have to pass.

He then proceeded to make a "mock sun" upon the screen by projecting a bright beam from the electric lamp, and making the light pass through a weak solution of hyposulphite of soda, into which he poured a little acid. Particles of sulphur were thereby slowly set free, and, as they increased, they more and more intercepted the light, so that the white disc on the screen slowly changed to yellow, then to red, and passed through all the changes of colour presented by the sun as it approaches the horizon.

He then described the sector photometer and the means of registering any colour the human eye can see.

---

## Patent Intelligence.

### Applications for Letters Patent.

2,880. T. R. Dallmeyer, 115, Cannon Street, London, "Means and Devices for Obtaining Projections of Photographs in Natural Colours."—February 17th.

2,934. C. Cloakly, 13, Northumberland Place, Bath, "Photographic Printing Frames."—February 18th.

2,935. W. J. Lancaster, 6, Livery Street, Birmingham, "Plate Carriers and Cameras."—February 18th.

2,956. W. G. Thomson and W. Ward, 8, Quality Court, London, "Photographic Focussing."—February 18th.

3,024. Marion and Co., 22, Soho Square, London, "Marion's Glass-Roller Hot Rolling Press."—February 19th.

3,042. J. Y. Johnson, 47, Lincoln's Inn Fields, London, "Artificial Light for Photography" (Paul Nadar, France).—February 19th.

3,071. Matthews and Son, St. John's Road, Ryde, "Frames for Exhibiting Photographs."—February 20th.

### Specifications Published.

2,828. *February 21st*, 1890.—"Opening and Closing Skylights." RICHARD FRIEND, 7, Culmore Road, Asylum Road, Peckham, London, Builder.

According to my invention, I arrange a frame of any suitable shape and material to carry a cog wheel such as is ordinarily employed for the driving chain of a tricycle. I also arrange this said cog-wheel to gear at one and the same time into a slotted flexible band or chain (by which motion is imparted to the cog wheel), and into a rack (which may be rigid, solid, or flexible, or jointed as a chain, so as to close down into little space) straight or curved, and of any suitable material, and which is fastened to the casement to be opened. The whole apparatus is operated from the flexible band or chain, to which cords and balancing weights may be attached for the greater convenience of manipulation.

20,876. *December 22nd*, 1890.—"Photographic Camera." RUDOLPH STIRN, 34, Sebastian Strasse, Berlin, Manufacturer.

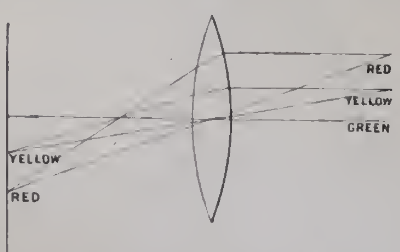
The invention relates to the construction of photographic apparatus, and its object is to construct the camera in such manner that the front part of the same, in which the lenses or objectives are mounted, is adjustable, by which a three-fold purpose is attained—viz., the employment of the camera for stereoscopic purposes, for the production of large photos (cabinet size), and for the production of two smaller photos (cartes-de-visite) side by side. The manifold employment of one and the same camera without having to remove the films, and by simply adjusting the lens box, offers the photographer many advantages: First, the apparatus may be employed for various purposes; and secondly, it enables the photographer to change from one style of photographing to the other without causing any further inconvenience whatever. Through the displacement of the lens box, one of the lenses is brought into a central position with the exposing chamber, the partition necessary for taking stereoscopic photos is folded down in the empty part of this chamber, and, simultaneously, shades for limiting the size of the cabinet photo are automatically brought into position.

In taking cartes-de-visite both lenses are employed, one after the other, whilst the lens box takes the same position as when used for taking stereoscopic photographs. For this the lenses, besides being provided with the necessary shutter mechanism for instantaneous or time exposures, have extra covers.

## Correspondence.

### HELIOCHROMY.

SIR,—To complete my letter of 18th inst., which you were kind enough to publish, and to substantiate my incredulity about Professor Lippmann's theory, I need only to draw the




attention of professional men to the elementary diagram of the action of a lens; I will take but three colours, to simplify the proof, and on the other side I will suppose (to give a fair play to the hypothesis) that the film is in direct contact with mercury, otherwise that there is no partition of glass between the incidental and reflected rays; well, the image being reversed, not one colour but the green meets again its own rays, the yellow rays intersecting the red ones, and the reflected red rays going astray. It seems to me as simple as two and two make four; but I am, of course, prepared to accept humbly my defeat if some more scientific man than I pretend to be will be able to demonstrate my error. L. NIEVSKY.

5, *Gransden Road, Shepherd's Bush, February 23rd.*

### THE NATIONAL PHOTOGRAPHIC EXHIBITION.

SIR,—Some slight misconception having arisen as to the construction of Rule 10, clause "*c*," affecting the challenge cup competition, as evinced by the letters received from various societies, I should esteem it as a favour if you will kindly explain (by the publication of this letter) that it means "the professional work *shall not exceed* one-fourth the number of whole exhibits." S. G. BUCHANAN WOLLASTON.

*Crystal Palace Company, Crystal Palace, S.E., Feb. 20th.*

### THE QUAGGA.

SIR,—Referring to letters which have appeared in the NEWS lately, and more especially to one in your issue of 20th inst., as to the photograph of the "quagga" (a print of which appeared in your last YEAR-BOOK), we beg to point out that Mr. B. Harvey has overlooked the fact that he was merely an operator on weekly wage while photographing in the "Zoo." for Mr. F. York. The camera, &c., he used there *belonged to Mr. York*, and was constructed by Mr. Meagher from special instructions given him by Mr. York. Mr. Harvey speaks of "*my instrument*," which, to say the least of it, is misleading.

We may mention that the said camera is still in our possession at the under-mentioned address. YORK AND SON.

87, *Lancaster Road, Notting Hill, London, W., Feb. 23rd.*

### THE FEDERATION OF LONDON PHOTOGRAPHIC SOCIETIES.

SIR,—I am sending the enclosed circular to all photographic societies in or near London, according to the most recent list in my possession. As, however, some societies may have been overlooked, or, owing to changes, may not receive the circular till too late, will you allow me to say, through your columns, that where a society cannot be officially represented, I trust that the secretary and a member of the committee will attend the meeting in a private capacity. Also I shall be glad to hear from the secretary of any country society approving of the proposed association. LEWIS M. BIDEN.

11, *Leadenhall Street, London, Feb. 20th.*

SIR,—I shall be glad if your Society can make it convenient to be represented by one or two members interested in the subject at a meeting to be held on Monday, March 2nd, at six o'clock, by the courtesy of the Photographic Society of Great Britain, at their rooms, 50, Great Russell Street, Bloomsbury (opposite the British Museum), to consider the following matters, and to make such arrangements as may be thought desirable:—(1) The association or federation of the London societies; (2) the interchange of lectures, papers, lantern slides, &c.; (3) as to obtaining the reduction of railway fares to amateur photographers on their outings; (4) whether any proposal can be made to the P. S. G. B. for admission of the various societies as corporate members of the P. S. G. B.; (5) how to assist in promoting the proposed Photographic Institute; and (6) generally to promote photographic knowledge and research.

I have long felt that it would be a great advantage to all concerned, particularly the junior societies, if they were brought more into touch with one another; the stronger could then help the weaker, besides deriving benefit from their own exertions.

Lecturers would be encouraged to devote more time and attention to the preparation of their papers; and societies, instead of being insignificant units scattered here and there, would feel that they were integral portions of some powerful body. See, for instance, the impetus given to association football by the formation of the various leagues and alliances. Thus we should be the better able to accomplish great works.

Which of our societies would undertake a survey of London? Some have made a commencement in respect to a small portion, but who will weld the portions into a homogeneous whole? Like the photographic chart of the heavens, one society alone can do little, but by united effort the work is comparatively easy of accomplishment.

If you are unable to send fully accredited representatives, I trust you, and one of the active members, will attend unofficially and represent your Society.

It will perhaps save time and assist me if you will let me have, in the course of the ensuing week, some particulars of your Society, especially all or any of the following :—Number of members, the terms of subscription, a list of the papers read, the names of any of your members who would read papers before another Society, or give lantern evenings ; also a list of sets of slides in the possession of your members would be useful.

I trust to hear from you by the 26th February, with any farther suggestions or subjects that may occur to you as suitable for the agenda paper.

LEWIS M. BIDEN, *President of the Toynbee Camera Club.*
11, *Leadenhall Street, London, E.C., Feb. 18th.*

## ANIMAL PHOTOGRAPHY.

SIR,—My note of December 1st, 1890, and my letter to you of January 19th this year, I had not intended for publication. It is my mistake. I sat down and wrote what I remembered, and what I knew to be correct. I am not in the habit of writing to newspapers, not possessing sufficient of the *suaviter in modo.* I hope I have done no harm, and surely none was intended. I received by this mail, along with my PHOTOGRAPHIC NEWS and *Journal*, a pamphlet by Gambier Bolton, on "Animal Photography." It would take time to write my opinion of it, but not very long to say right out what I think of it. According to his statement, it has taken him from fifteen to eighteen years to arrive at his present state of efficiency. There is a beginning to all things, great and small, and I would like to see Mr. Bolton's earlier attempts with his sixty-shilling Fallowfield. Ambition (without which no man is worth knowing) and an artistic training no doubt have led him to the goal, from the pinnacle of which he looks down with somewhat of scorn on his followers ; but that is no reason why he should make a stab at everybody and everything that comes in his way. The maker of his camera, lens, and, above all, of his plates, received not a "Thank you." No ! "Alone I did it," as Du Val would say. Yet methinks there is a soft place in his heart, for on page 7 of his pamphlet he says, "Forgive me if I have spoken too strongly on the subject." This is sufficient answer in itself that our worthy hero is of the right sort.

To my mind it would have been infinitely preferable if Mr. Bolton had published his experience with these animals in book form, instead of making such wholesale denunciations of former efforts and their producers. None of us are too old to learn. There has been an evident tendency for some years past for those who have reached the topmost rung of the ladder to decry the efforts of their less fortunate brethren. I will explain myself. Many of our leading photographers retired from business, when the cares of the profession lie lightly on them, are in the habit of writing down what should be done, and what should be left alone ; how high art should be cultivated, more of the picturesque chiaroscuro, &c., and how we should lift ourselves out of the mire we are "flummuxing" in ; drop retouching, and study the facial muscles, and not make a marble statue of everything we touch—All very well in its way, but they did not say the same when they were struggling for £ s. d. A fellow-feeling makes us wondrous kind, and I should like to see those who are enjoying honourable rest and retirement after they have fought the battle of life being a little more practical in their remarks. If they want anything to do, let them gird up their loins, and rid the country of the penny plain and two-penny coloured tribe, the parasites of the profession. Then will their light shine before men.

I am wandering from the pamphlet. On page 6 Mr. Bolton says : "Many of our oldest workers are the chief offenders, and, rather than lose some picturesque group, will take a negative of a horse, cow, &c., with tail or ears blurred. Might I say that professional photographers have no time at their disposal to wait for ears or tails. These are manufactured on the premises." Perhaps Mr. Bolton does not know this, but it is true. From the sketch of the lion on the cover of the pamphlet, the carnivora must be differently housed than at the time I photographed them. It would be next to an impossibility to have taken them without the bars. They are not the most difficult of the animals to take, but they made the most unsatisfactory pictures, owing to their appearing behind the bars. With such perfect instruments, and small lenses of great rapidity, one ought, I should think, to secure positions to satisfy the most fastidious.

Five minutes more, and this letter will be whirling on its way to London from the land of diamonds, the richest bit of earth under the sun. I must close. To Mr. Bolton *au revoir.* Don't think I have got "the hump," or "the needle," or whatever you call it in London. B. HARVEY.

*The Kimberley Photographic Studio, Feb. 2nd.*

## THE GLOUCESTERSHIRE PHOTOGRAPHIC SOCIETY'S SECOND TRIENNIAL EXHIBITION.

SIR,—Will you kindly favour us with a paragraph announcing the judges, viz., Messrs. H. P. Robinson, Valentine Blanchard, and Edward Brightman, in accordance with the prospectus conditions ; also calling attention to the date for closing entries, March 13th. The arrangements are well in hand, and we anticipate as great an all-round success as we had in 1888.

F. H. BURR, *Joint Hon. Sec.*

137, *Westgate Street, Gloucester, February 24th.*

## A RENUNCIATION.

SIR,—My attention has been called to a sentence or so of "A Renunciation," by Mr. P. H. Emerson, printed in the PHOTOGRAPHIC NEWS of January 23rd. I quote from it as follows : "Suggestions have been made that I got some of my ideas from a book called 'Naturalistic Painting.' I have a letter in my possession from an artist, wherein is stated clearly and exactly that Mr. Bate* had read a paper of mine on 'Naturalistic Photography,' *before* his first article appeared in *The Artist.*"

With reference to it, I would ask you, Sir, to publish the fact that before this I had not known of Mr. Emerson or his paper on "Naturalistic Photography," or any other work that is his.

This being so may not affect Mr. Emerson in the position which he takes with his footnote, save that, *ex fide bona*, he will probably be desirous of disclosing the letter to which he refers, and the name of the writer of it. FRANCIS BATE.

*Applegarth Studio, Augustine Road, W., Feb. 24th.*

## REDUCED RAILWAY FARES FOR PHOTOGRAPHERS.

SIR,—The following was addressed to the railway companies running out of Liverpool. I should be glad if local photographic societies would aid our efforts to obtain greater railway facilities than we at present receive. THOS. S. MAYNE.

*Liverpool, Feb. 24th.*

THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION, 1891.

SIR,—This important function (triennial) takes place this year from March 6th to April 4th. It will, without doubt, be on the largest scale of any similar exhibition ever held in the Kingdom. The Liverpool Corporation has granted the use of the greater portion of the Walker Art Gallery. We anticipate visitors to the extent of at least 50,000.

Probably interest in the Liverpool Exhibition is everywhere the feature of importance in photographic circles all over the country.

We now only want the help of the railway companies to double our number of visitors. The growing popularity of photography with the rising generation amongst all classes of our community, from the highest personages to the middle class and enlightened artizans, is not recognised to the extent it deserves by railway companies. Like cycling, it is only in its infancy ; photography and cycling are the landmarks of the nineteeth century as elevating pastimes.

* This does not imply that Mr. Bate took any ideas from my paper ; on the contrary, I feel sure his ideas were his own, as were mine.

What I now beg you to grant is return tickets at single fare (day tickets) during the currency of the Exhibition from all stations within thirty miles of Liverpool to holders of our season tickets, or purchasers of single admissions, which tickets I will provide you with (the shilling admission tickets). On hearing from you, I will circularise all the local and county photographic associations within this radius.

I have written this letter to your brother railway superintendents of the three chief railways terminating in Liverpool.

The favour of an early answer is requested.

Thos. S. Mayne, *Hon. Sec.*

---

PROF. MELDOLA ON PHOTOGRAPHIC CHEMISTRY.

Sir,—I have pleasure in enclosing a copy of the syllabus of the lectures on "Photographic Chemistry," which Professor Meldola is to deliver here. H. T. Wood, *Secretary.*

*Society of Arts, February 24th.*

Lecture I.—*March 9th.*—Photography as a branch of technology—Methods of giving instruction in the subject—The preliminary training essential—Photographic materials—Silver and its compounds—Reduction and oxidation occur simultaneously—The forms of reduced silver; grey and black deposits—Supposed allotropic modifications of reduced silver—The haloid salts of silver; their behaviour towards reagents; influence of solvents; formation of double salts—The state of molecular aggregation—Order of reducibility.

Lecture II.—*March 16th.*—The existence of subsalts of silver—Coloured forms of the haloids—Photo-salts—Colloidal organic compounds of silver—Silver albuminate and "gelatino-nitrate"—The principle of emulsification—Other photographic materials—Photo-physical and photo-chemical change—Modification of crystalline form under the influenc eof light—The action of light on asphalt—Photo-chemical study of iron compounds—Photo-chemical study of mercury and copper salts.

Lecture III.—*March 23rd.*—The action of light on the silver haloids—Accelerators and retarders of photo-chemical decomposition—The invisible products of the action of light on the haloids—Sensitive films—The function of the vehicle in modern emulsions—The invisible effect of light on the haloids—The photographic image—Development and subsequent processes.

## Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting of this Society held on the 24th inst. Mr. Leon Warnerke occupied the chair.

As matter of historical interest, Daguerreotypes taken in 1842 and 1843 were shown by Mr. C. F. Hayward. It was stated that in those early days there was great difficulty in obtaining a sufficient polish on the plate.

The Chairman called upon Mr. W. E. Debenham to open the discussion on "The Dark Room and its Fittings," which stood for that evening's consideration.

Mr. Debenham said that, as he was responsible for the arrangement of the Society's dark room window, he would describe that to start with. There were four sliding frames, any or all of which could be drawn into or out of position, and outside all was a fixed frame containing deep yellow pot metal. One of the sliding frames was furnished with cherry fabric, one with two thicknesses of golden fabric, one with stained red glass, as recommended by Captain Abney, and one with a yellowish-green glass. A fitting for the dark room which he hoped would soon be provided was a cupboard for drying plates after being backed, or treated with orthochromatising solution. He would also like to have a levelled shelf in it suitable for drying collotype plates, but that would also require thermometer and regulator. Backing plates was a practice that, he thought, was not nearly so general as it ought to be, and that probably many were deterred from carrying it out on account of the difficulty of finding suitable means for preventing access of light whilst drying. A plan which might be considered makeshift, but which he had known to be quite successful where only a few were required, was to thoroughly dry, in an oven, ordinary cardboard grooved boxes; two or three plates put in shortly afterwards would then dry very well in such a box.

With regard to backing, the Chairman had very successfully employed a hygroscopic gelatine film spread on paper, and stained of a non-actinic colour, placed in optical contact with the plate.

Mr. Debenham had found great difficulty in getting optical contact with such a film, even on clear glass, and working in a good light. It would be all the more difficult to secure on plates covered with emulsion, and backed in the dark room. He thought there would be considerable surface of air spaces.

Mr. E. Clifton confirmed this view. He had not succeeded in getting optical contact all over the plate, even when using plain glass for experiment, and working with a squeegee in daylight.

A number of dark room appliances, including dark room lamps, celluloid dishes, glass measures, and dropping tubes, was then examined and discussed. A lantern presented to the Society by the Stereoscopic Company was shown and described by Mr. Clifton. In front there were grooves fitted with movable frames, one containing golden fabric for ordinary use, and another ruby glass for exceptional cases. There was an Argand burner in the centre, but, for developing, a small screen prevented the direct light from reaching the front of the lantern, which was lit only by reflected light from the yellow enamelled surface of the sides and back. The screen could be lifted from the outside, so as to allow of extra light towards the end of the development.

A travelling lamp of folding millboard, used with a night-light, and fitted on one side with cherry fabric, and on another with golden fabric, was then handed round. It was remarked that two thicknesses of golden fabric should be used, and there would still be plenty of light.

Mr. J. Desire England showed a candle lamp furnished with a hood, and supplied with discs of glass of different colours made by Messrs. Benham. It was recommended to have the face of the hood directed away from the operator, and towards a sheet of white material, the reflection from which served as the source of illumination.

Mr. Debenham suggested the use of a yellow material for the reflector.

Mr. Clifton had not heard a rocking table mentioned. It was a very convenient appliance, and he thought deserved to be more generally used.

On the colour of the dark room illumination, the Chairman said that he had taken the ruby glass out of his lamps, and replaced it by canary medium. He did not use ruby glass on any occasion.

The Chairman then introduced the question of photography in colours in connection with Professor Lippmann's recent announcements. He had begun experiments on the lines indicated, but the great difficulty he met with was in obtaining mercury sufficiently pure. In commercial mercury there were other metals dissolved which affected the silver compounds.

Mr. W. England offered to present to the Society a drying cupboard which he had had made in the collodio-albumen time.

A vote of thanks for this offer was passed; also to Messrs. Reynolds, Preston, Hayward, Vevers, Benham, and the Stereoscopic Company for the articles brought to the meeting or presented to the Society.

It was announced that Mr. Leon Warnerke would give a demonstration of a simple collotype process, and read a paper on it, on Wednesday, March 4th; that Sir David Salomons would exhibit an appliance for the registration of slides in the optical lantern, and read a paper, on March 9th. A discussion on hand-cameras will take place on March 24th, and on animal photography on April 28th.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

*February 19th.*—Mr. S. G. B. Wollaston in the chair.

Mr. W. Moran showed silver prints of some flash-light pictures of wrestling; these had been reproduced in the *Daily Graphic.*

The Chairman mentioned an instance in which he started developing six negatives at three o'clock in the afternoon; these were fixed, washed, and dried, and bromide prints were taken from them, and sent to the office of the *Daily Graphic* the same evening. They appeared the next morning.

The Hon. Secretary handed round samples of varuished wire gauze. It being uubreakable, he thought it might prove a good substitute for dark-room windows. It was made in various colours.

Mr. J. B. Wellington exhibited an optical lantern, the joint invention of Messrs. Pringle and Beard. The aim of the inventors was extreme portability. This is attaiued by an arrangement by which, when the lantern is uot in use, the jet is held in a receptacle at the bottom of the lantern. The lens is packed iu the body of the lantern, and the chimney in the place occupied by the slide carrier; the whole can then be packed in a box 9 by 8 by 6½. It was stated to be of the highest efficiency in working.

The Chairman asked for the opiniou of members as to the relative advantages of cylindrical and flat limes.

Mr. T. E. Freshwater was not sure that flat limes possess any material advantage over the usual cylindrical form. He had heard some operators speak in favour of them. The opportunity of testing the relative merits of the two kinds of limes did not often occur, the cylindrical form being the only kind of lime on the market. He had recently had some flat limes turned, which he intended to try, and he would communicate the result at a future meeting.

The Chairman had made a few experiments with flat limes. He was of opinion that he obtained better illumination. A flat lime was easier to revolve and adjust, the staging being more simple.

Mr. A. Haddon passed round a sealed glass tube containing crystals of eikonogen which had been exposed to light for over a year without change of colour.

Mr. J. P. Everitt said he had kept eikonogen preserved with bisulphite in an uncorked bottle for two or three months with but little change of colour.

The Chairman had recently taken some photographs of hoar-frost, using orthochromatic and ordinary slow landscape plates. With a clear atmosphere and bright blue sky, the orthochromatic plates gave the best negatives; but the reverse was the case when a thick London fog prevailed, and the sky was veiled. He thought this quite contrary to the usually accepted theory.

Mr. A. Cowan exhibited a series of negatives showing comparative results with various developers. An identical exposure was given in each case, aud the development limited to two minutes each. The following developers were used:—Eikonogen, hydrokinone, and soda; pyro aud ammonia; hydrokinoue and caustic potash; hydrokinone and soda. With the last mentioned, development was allowed to coutinue for six miuutes.

The general opinion of the members was that but very little difference was observable iu the results.

---

### The Glenalmond Photographic Club.

At the fortnightly meetiug held last Saturday, Mr. E. H. Cunningham Craig delivered a lecture on "Lantern Slide Making and Painting," after which there was a discussion.

Messrs. C. C. Robertson (Glasgow), A. M. Dykes, F. Moore, and F. Harrison were enrolled as members.

---

### The Croydon Microscopical and Natural History Club (Photographic Section).

*February 20th*—Lanteru evening; the President in the chair.

Mr. W. Low Sarjeant passed a series of slides through the lantern entitled "Round about Exmoor." The whole of the pictures, which were from negatives made on films, were of high order. Mr. Sarjeant operated the lantern, and Mr. Sheldon, who accompanied him on his tour, gave a brief description of each slide, coupled with accounts of numerous amusiug incidents that occurred on the way.

The next ordinary meeting will take place on March 6th, and lautern uight March 20th.

### The Birmingham Photographic Society.

A meeting of the section of this Society which has undertaken to survey, photographically, part of the county of Warwick, was held at the Colonnade Hotel, New Street, on Thursday evening, February 19th; Mr. Jethro A. Cossins, the well-knowu architect and archæologist, occupied the chair, and a large number of photographers was preseut.

The officers of the section for the coming year were elected as follows:—*President*—Mr. J. B. Stone, J.P., F.L.S., &c.; *Vice-President*—Mr. J. A. Cossins; *Treasurer*—Mr. S. G. Mason; *Secretaries*—Messrs. J. H. Pickard and W. Jerome Harrison; with a committee of eight members.

It was resolved that the work of the coming season should be confined to the Hundred of Hemlingford, which forms the northern part of Warwickshire, including Birmingham, Tamworth, Nuucaton, and Solihull. The six-inch ordnauce map is to be the basis of the survey, and each member was requested to undertake one of the sheets of this map, with a view to securing a photograph of every prominent, remarkable, or historic object contaiued in that sheet. It was farther resolved that each worker should "report progress" by the end of Juue.

---

### The North Middlesex Photographic Society.

*February 23rd.*—Mr. J. Saville occupied the chair.

Mr. Lewis Medland exhibited his collection of slides, about 250 in number, entitled "A Day at the Zoo," and, to the wonder of the nou-photographic visitors, these were preceded by a picture of the lecturer taking a snap-shot in Epping Forest at a gigantic liou, quite fifty feet in leugth from his mouth to the tip of his tail. Mr. Medland exhibited, among others, several fine slides of the lions, lionesses, and cubs; some of these were taken inside the cages, thus avoiding the bars. A spice of danger atteuded some of these shots; one lion nearly secured the lens as a memento of Mr. Medland's visit. One photograph was of the inside of the mouth of the hippopotamus. A good slide of the kangaroo with her young peeping from her pouch was exhibited. Mr. Medland incidentally described some of his owu adventures in South Africa and in Western America.

---

### The Richmond Amateur Photographic Society.

At the meeting last Friday Mr. Ardaseer occupied the chair. The award of Mr. J. B. B. Wellington on the recent competition in landscape photography was made knowu, and the batch of prints handed to the successful competitor, Mr. Ardaseer.

Mr. Cembrano gave a practical illustration of the difference in tone which can be produced in gelatine lautern plates by varying the exposure, using the same negative and same developer. He exposed and developed the plates, giving to the second four times, and to the third sixteen times the exposure of the first. Au excellent slide resulted in each case, but the tone varied from a brown black in the shortest exposed, to a warm purple in the longest.

An ingenious registering printiug frame for lantern slides, designed by Mr. A. Cowau, of Marion and Co., was shown by Mr. Cembrano, and some lantern plates sent by Messrs. Thomas and Co. were distributed among the members.

---

### The Bristol Amateur Photographic Association.

The annual meeting for 1891 was held in the new premises of the Literary and Philosophic Club, 28, Berkeley Square, Bristol, on Friday, Jauuary 16th, 1891, and was the first meeting of the Association in its new home. There was a good attendauce of members, iucluding Mr. H. A. Hood Daniel (president) and Mr. F. B. Bond (hon. sec.).

The Hon. Secretary presented the accounts of receipts and expenses of the Association to the New Year. With reference to an amount paid by the Association during the past year for hire of boats—a charge really incurred by a comparatively small number of members at the June excursion—it was proposed by Mr. J. W. Evens, and seconded by Mr. G. H. Wills, "That all members who send to the secretary a favourable reply to any notice of an excursion shall be held liable for their share of all general expenses connected with the same." This motion was carried.

Mr. William Molice was proposed as a member of the Association, and unanimously elected.

Mr. W. W. Boyden proposed that, seeing that no notice of resignation of any of the officers of the Association had been tendered, the present officers continue in their several offices for the coming year. This was carried.

Mr. Hemmons proposed, Mr. Lavington seconded, "That the remaining members of the council be re-elected for the ensuing year." This also was carried.

The President spoke of the new and favourable auspices under which the Association was starting the year, of the increase both in the number of members and in the heartiness of their co-operation, and the evident progress made by the Association.

A set of rules, drafted by the Committee, was submitted to the meeting, and passed unanimously.

Supper was served at 9.45 p.m., and fourteen sat down.

The February meeting of the Association was held at No. 28, Berkeley Square, on Friday, February 6th. Mr. H. A. Hood Daniel presided. Mr. Walter L. Stephens, formerly a member of the Association, was proposed for re-election, and, after a ballot, was declared unanimously re-elected.

The cash statements and balance sheet for the year 1890 were submitted by the Hon. Secretary, and read to the meeting. Mr. W. C. Hemmons and Mr. J. Phillips were appointed auditors.

Mr. John Lewis then proceeded to demonstrate to the meeting the new "Kallitype" printing process.

The Epping Forest Photographic Society, Leytonstone.

The first public display took place on the 18th inst., when an exhibition of some 300 pictures, chiefly the work of members, was opened. Among the photographs exhibited was a collection lent by the editor of *The Boys' Own Paper*, which was interesting as the work of young photographers.

The exhibition was followed by a lecture by Rev. J. Bradford, descriptive of the way to take a photograph, and the non-photographic audience was delighted when some flash-light exposures were made, and several plates developed in their presence, the hall being temporarily converted into a "dark-room."

After this some excellent slides were shown; those by members being specially appreciated.

At the next meeting, on March 16th, Mr. H. W. Bennett will read a paper on "Negative Making," and the Secretary (Mr. J. W. Spurgeon, Drayton Villas, Leytonstone, Essex) will be glad to hear before then from intending members.

The Glasgow and West of Scotland Amateur Photographic Association.

At the monthly meeting held in West Regent Street on the 16th inst. six new members were elected.

Professor Barr, of the University, showed and explained an apparatus of his own invention for photographing book illustrations and diagrams so that they may be projected on the screen by means of the optical lantern.

Professor Barr was complimented on the novelty and ingenuity of the construction.

The President made two enlargements from hand-camera negatives by means of the lime-light lantern, and Mr. F. L. Alexander passed about thirty slides through the lantern, illustrating a tour to Stornoway.

The Photographic Club.—Subject for discussion on March 4th, "Printing on Rough-surfaced Papers."

The Gloucestershire Photographic Society's second triennial Exhibition will open at Gloucester April 20th, and close April 30th.

Received.—From the London Sensitised Paper Co., some samples of albumenised paper, which we have tried, and found to work all right.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

The Photographic News is the oldest weekly photographic newspaper. See its consecutive number to-day on the front page.

F. D. T. (Edinbro').—*Historical Portraits and Specimens.* A fine portrait of H. Fox Talbot was published with the News of March 11th, 1881. Mungo Ponton's formed the frontispiece of the Year-Book for 1882. Frederick Scott Archer, from a negative by the late Robert Cade, appears in Mr. J. Werge's series, at page 58 of "The Evolution of Photography" (Piper and Carter). With regard to the other matter mentioned in your letter, we will call and make personal enquiry, and let you know the result.

H. S. (Eastbourne).—*Paper Negative.* At first glance, your "curiosity" appears to be both interesting and important, but you do not say how it is done. Whether printed out or developed, and what length of exposure?

J. R.—*Collotype Materials.* For rollers and ink, inquire of Messrs. Benjamin Winstone and Co., Shoe Lane, Holborn. Mr. Wilkinson's book will give you preliminary information, and explain the method of reversal.

A. D. (Boston, Mass.)—*Direct Portraits, Life Size.* In the year 1874 Mr. John Chaffin, of Yeovil, gained a first prize in the Crawshay competition, and as considerable interest attached to the mode of production of his life-sized heads, a paper was read before the Photographic Society, giving full particulars of process, studio, and appliances. The lens used was a 6½-inch portrait combination by Jamin, of Paris, having back focus of about 20 inches, and stopped down by the insertion of a 3-inch central diaphragm. Mrs. Cameron's work was done a few years earlier than this, but in the present day it cannot be necessary to revert to the old processes (collodion) and primitive methods then in use. Messrs. Robinson and Cherrill employed a Dallmeyer 7D lens for their life-sized heads, which took the first Crawshay prize in 1873. See *Photographic Journal*, vol. xvi., pp. 3 and 81.

M. T.—*Watkins' Exposure Meter.* In our reply to you last week, the standard tint was described as being obtained by two seconds' exposure to *clouded* sunshine in June, instead of which we should have said "unclouded." The magnesium standard, of more importance, was correctly stated.

Litho.—*Artificial Stones.* It is doubtful whether the artificial magnesium blocks will bear any comparison with the true Bavarian stone. Mr. Warnerke may possibly touch upon this point in his forthcoming lecture (March 4th) on "A Simplified Photo-Collographic Process."

A. T.—*The Sector and Grease-Spot Photometers.* The discussion is not yet finished, Messrs. Hurter and Driffield making long replies to Captain Abney and Mr. Chapman Jones at the Liverpool meeting. The authors likewise read an important paper on the "Relation between Photographic Negatives and their Positives," giving experimental proofs of their statement by printing transparencies on ordinary and instantaneous plates, which, although widely different as regards length of exposure, were allowed to have been perfectly timed.

F. C. S.—*The Chemical Society's Jubilee* passed off satisfactorily on Tuesday. The afternoon meeting at the University of London was addressed by the president, Dr. W. J. Russell, F.R.S., by Sir Lyon Playfair, Sir Wm. Grove, and Professor Odling. There were deputations from the Royal and Pharmaceutical Societies, and from many foreign chemical societies. An interesting feature of the proceedings was the presentation of an album containing the portraits (platinotypes) of forty-four of the original Fellows of the Society, only three of whom are now living. The evening reception at Goldsmiths' Hall was a grand success, an admirable selection of scientific objects being displayed. On Wednesday the function terminated with a dinner at the Metropole.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1696.—*March* 6, 1891.




CONTENTS.

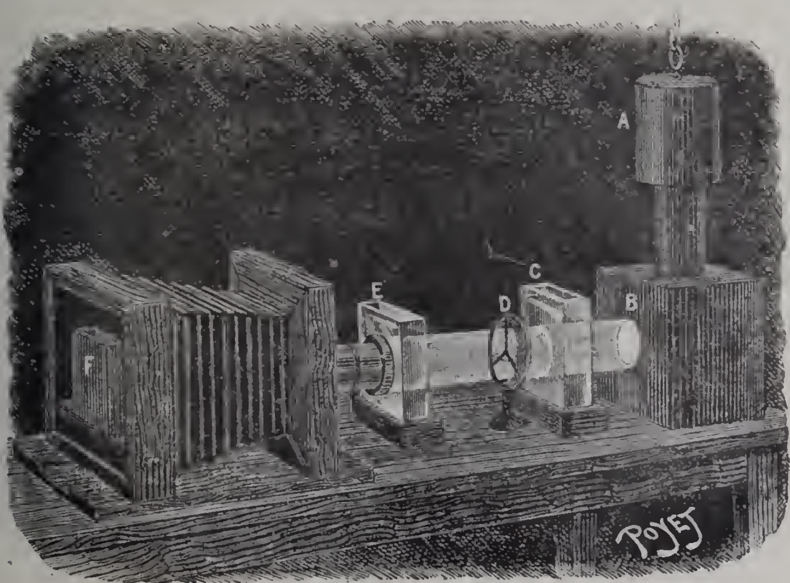


## THE NEW DISCOVERIES IN HELIOCHROMY.

Among the chief points in which experienced practical photographers might attempt to help to adapt the recent great discovery of Professor Lippmann to utilitarian purposes are:—(1) The production of an absolutely colourless and transparent dry plate highly sensitive to light; (2) to find a developer for the said dry plate which will give a shining silvery-white image by reflected light, and a pure black or grey one by transmitted light; (3) the application of suitable orthochromatic methods of rendering the plates more sensitive to red and yellow light.

By the wet-plate process there was no difficulty in getting silvery whites, as in the collodion positive process, in which an iron developer was used in conjunction with a suitable proportion of glacial acetic or nitric acid; a trace of nitric acid had a strong influence in the yielding of a brilliant white deposit. The wet process is, however, in all probability, not applicable to these heliochromic pictures, because of the film being expanded with liquid at the time of making the exposure; consequently, any interference bands registered by means of the film will not be of the same distance apart when the film shrinks in drying.

The *Photo-Gazette*, of Paris, in its number of February 25th last, gives the accompanying engraving of the apparatus used by Professor Lippmann in photographing what the *Daily News* correspondent called his "stained glass window." This window is represented at D, and it consists of three pieces of coloured glass, mounted in a circular frame. A is a loose cap over the chimney of the electric lamp, to exclude stray light from the room; B is a parallel beam of light from the electric lamp; C is a vessel of water to cut off some of the heat rays; E is a vessel containing elianthine to cut off the blue rays while giving a longer exposure to the red; F is the trough carrying the sensitive plate and its mercurial backing.




A communication from Lord Rayleigh, in another column, shows that he long ago published the idea that the colours in Becquerel's photographs were those of thin plates. He speaks of Wiener's experiments; Wiener seems to have been the first to photograph interference bands in thin, transparent sensitive films, and he just missed discovering the value of the method in heliochromy. A week before M. Lippmann announced his discovery at the Academy of Sciences, M. Cornu drew the attention of that august body to a paper by Herr Weiner, contained in *Wiedemann's Annalen*, vol. xl., page 203, 1890, giving the experimental solution of the problem of determining the direction of vibration in polarised light. "The method consists in letting a wide beam of polarised light fall upon a reflecting surface at an angle of 45°. As the beam is wide, there is a zone where incident and reflected rays cut one another at right-angles; and if interference phenomena are produced in this zone, the direction of vibration of the polarised light must be normal to the plane of polarisation, and perpendicular to the direction of propagation. In order to find the nodes and ventral segments, M. Wiener has used an extremely thin photographic pellicle, so transparent that it will allow a free passage to the two waves which cross at its surface, and yet sensitive enough to receive impressions. By means of this exploring pellicle, the existence of interference fringes has been made manifest."

Mr. Frederick Varley has been minutely studying the character of the planes of quiescence and disturbance in films, as prepared by M. Lippmann, and has come to the conclusion that they are not absolutely true planes, but are a range of little hills and valleys; the planes are speckled, so to speak.

M. Lippmann's coloured photographs have, like Daguerreotypes, to be viewed at a particular angle to the incident light, and the colours are seen best with a lack background to the plate.

At the meeting of the Photographic Club of Paris held on February 18th last, Dr. A. Berget, of the Sorbonne, exhibited some of M. Lippmann's heliochromes, and described the method of their production. The official report in the *Bulletin* of the Club says that repeated bursts of applause testified to the interest the assembly took in the scientific communication of M. Berget. The communication of the latter is printed in the *Bulletin*, so also is an illustrated article on the subject by M. Ch. Gravier, but they contain no additional information to that already published in these pages.

In *Le Moniteur de la Photographie* of February 15th, M. Léon Vidal says of M. Lippmann's photographs:—"The impression—or rather the sensation—of the spectral colours is very decided; certain proofs are even brilliant."

Merely as a matter of history, a translation of the statement made by M. Becquerel at the Academy of Sciences, the same evening that Professor Lippmann's discovery was first made known there, is hereunto appended, but we doubt the scientific accuracy of its contents. As stated in these pages last week, Becquerel's preliminary treatment of his films seems but to have made them slightly more continuous and transparent, so that interference phenomena could come more perfectly into play, but, no colloid support being present, the pictures dissolved away in the fixing solution. Becquerel argues that his pictures are not due to the action of the same principle as those by Professor Lippmann, but gives no evidence in support of the contention; the former produced the pictures empirically and industriously, the latter seems to have revealed the true theory of obtaining such photographs in colours, and to have evolved law and order out of chaos. Here is M. Becquerel's utterance:—

"I wish to point out the difference which exists between the purely physical process of M. Lippmann for reproducing the colours of light by photography, and the photo-chemical process which I discovered in 1848 for obtaining the coloured images of the luminous spectrum, as well as the images of objects in their natural colours. I attained this end by means of one chemical substance—viz., the subchloride of Ag formed on the surface of silver plates, the preparation and curious modification of which, under various influences, and notably under that of heat, I have already pointed out. Moreover, during the preparation of the sensitive substance, one can determine with precision the thickness of the layer required to produce the best possible results. This thickness may vary between one-four-thousandth and one-six-hundredth of a millimeter. These images are absolutely permanent in the dark, and I still possess reproductions of the solar spectrum made forty years ago, as well as images coloured by light waves, which were the base of Regnault's report to the Academy in 1849. They are only spoiled when exposed to the action of light, because the sensitive substance with which they were obtained was not completely transformed, and is still liable to be acted on by various coloured rays. M. Poitevin used the same substance in 1865 to obtain on paper the coloured images which were produced by me on metallic plates.

"When one submits photographic images thus coloured to the reducing action of one of the solvents of silver chloride, such as ammonia or hyposulphite of soda, the coloured shades disappear, and on the spot where the luminous rays have exerted their action, a light trace formed by a thin layer of metallic silver remains on the surface of the silver surface, which, as long as it is still moist, shows feeble tints, the complementary colours of which had existed previously in the same spots. These effects, which *à priori* are difficult to explain, show, perhaps, that the thickness of deposited films plays some *rôle* in the production of colour phenomena.

"This material, when duly prepared, enjoys the peculiar property of not only being sensitive to the action of various colour rays, varying from red to violet, whilst reproducing their proper tints, but also of receiving an impression which appears in marked manner to be proportionally to the intensity of the corresponding luminous impressions on the retina.

"At the moment when the chemical reaction takes place, this photo-chromatically sensitive substance produces an electro-chemical current whose intensity and electromotive force can be measured with my electro-chemical actinometer. This current may be utilised for comparing accurately the intensities of the different active coloured rays—*e.g.*, the red and blue rays—whilst the optical methods based on the impressions produced by these very same rays on the retina do not allow of being made with anything like the same accuracy."

The undercurrent of prevalent interest in photographic circles about the new heliochromic discoveries was indicated last Wednesday night at the Photographic Society, when Mr. Warnerke departed from his subject to hand round a strikingly iridescent negative, the colours on which, he remarked, were no doubt like those obtained by M. Lippmann. Probably this is true. A few days ago a photographer remarked to a well-known scientific man, "Lippmann's discoveries are nothing but iridescence." "Very likely," was the rejoinder, "but perhaps hitherto we have not paid sufficient respect to iridescence."

Professor Lippmann uses a hypophosphite to fix his pictures, but in his letter to us stating the fact, the words following "hypophosphite" are so indistinctly written, that we cannot state the exact salt.

---

The Photographic Society of Great Britain.—On Tuesday, March 10th, Sir D. Salomons will read a paper on the "Registration of Slides in the Optical Lantern." On Tuesday, March 24th, "Hand-Cameras" will be the subject for discussion. On Tuesday, March 31st, exhibition of lantern slides.

## DARK ROOM VENTILATION.

The modern photographer is very well catered for in the matter of literature. Not only has he many journals and periodicals, both English and foreign, all to himself, but he has a rich library of books all dealing with questions directly relating to the occupation in which he is engaged. A few years ago, before gelatine plates came into common use, such books were so few in number that they could almost be counted upon the fingers of one hand; but with the creation of the modern amateur there came a change over the scene, and text-books and hand-books without number were issued until it became a serious matter for an author to find a title for any new publication which he might be contemplating. Authors now seem to be attacking the art piecemeal and in detail. They no longer find it possible to compress an entire account of the various processes into one volume, and so we have separate *brochures* on such subjects as developing, retouching, portraiture, &c., which, in themselves, begin to form a complete library. There are so many workers, and the army is so constantly receiving recruits, that there is little fear of such books, especially if they are written with a fair amount of skill, not meeting with a ready sale.

But there is one subject which, we think, has not been treated as exhaustively as it should be, considering its great importance. We allude to the ventilation of the dark room, in which the photographic worker is obliged to pass so much of his time. An ordinary room is, as a rule, well ventilated, unless, that is, it belongs to one of those over-crowded dwellings in the East End of which we have lately heard so much; for an ordinary dwelling room has its chimney, its windows, and its doors, and, as most rooms are found in houses in which neither doors nor windows fit into their frames, and in which nooks and crannies in floors and wainscots let in the winds of heaven from every conceivable direction, there is little chance of suffocation. The favourite Parisian method of committing suicide by burning charcoal in a closed room has never found favour in England, most possibly because of the utter futility of attempting it. The jerry builder has made it impossible, and this seems to be the only good thing that a jerry builder has ever done.

But in the photographer's dark room the conditions are altered. There is often no chimney; the window is carefully covered up with opaque material, except a single red pane, and even the door is bushed with cloth all round to keep out any stray ray of light which may endeavour to find an entry. This is as it should be, but the photographer too often forgets that in thus shutting out the daylight which is so prejudicial to his proceedings, he has also been excluding the fresh air which is so necessary to health; and as good work is only possible if the worker be in good health, he indirectly is affecting the first by neglecting the second.

We constantly hear of operators who complain of the bad effect of certain chemicals upon their well-being. Ammonia, being the only chemical in common use which has a pungent smell, is credited with all sorts of direful effects. One worker told us gravely how continued use of that agent had made him deaf. Another spoke of the injury which it had caused to his respiratory organs. Many, also, have complained of the lassitude and headache which they suffer from after an unusually long spell of development. Now, we are quite satisfied, from the many opportunities which we have had of seeing all sorts and conditions of dark rooms, that in the majority of cases no fault can be laid to the door of the chemicals The mischief is almost always traceable to the want of ventilation.

Even in studios where everything is well appointed, where there is a handsome reception-room, and where all strikes the eye as being expensive and good, the dark room is often little better than a mere cupboard. Well may the operator call it his den. There he is condemned to work, and although he may not use ammonia, or any other strongly smelling chemical, he is giving off from his own lungs a far more poisonous product, in the shape of carbon dioxide, than anything that he has in the bottles around him. If he has a lantern as an aid to uncertain daylight, its lamp is also busy in the same work of vitiating the atmosphere. It is no wonder that the poor fellow feels done up at the end of the day's work. And the remedy is so easy. Let him bore a few holes in a row at the bottom of the door, and cover them with a sloping board, in order to give entry to fresh air from outside. Then, with a ventilator at the top of the room, which can be equally well shielded against light—to provide egress for the heated air inside, which is bound to rise upward—he will secure a constant current, which will make his work easier and more pleasant than it has been before, for he will no longer be suffering from deprivation of fresh air.

---

The Photographic Club.—Subject for discussion on March 11th, "Printing on Rough Surfaced Papers;" March 18th, "Estimating the Speed of Shutters."

There will be an exhibition of photographs and apparatus by members of the Croydon Camera Club, at the Braithwaite Hall, Wellesley Road, Croydon, on Tuesday, 31st March, and Wednesday and Thursday, 1st and 2nd April.

The Hackney Photographic Society.—The following is the programme for March and April, at Morley Hall, Hackney, Room No. 4:—March 12th, "Bromide Enlarging," Mr. A. R. Dresser; March 26th, "Lantern Slide Making," Mr. J. A. Sinclair; April 9th, "Hand-Cameras," Mr. W. D. Wellford; April 23rd, Members' Lantern Night, (all members are requested to bring some slides). Members are requested to note that nominations for Council and other official positions, together with any proposal of rules or amendments, must be sent to the Hon. Secretary in writing not later than April 14th next; W. Fenton Jones, *Hon. Sec.*, 6, Victoria Street, Hackney, N.E.

Soldering Glass to Metal.—At a recent meeting of the Société de Physique, M. Cailletet described a process of soldering glass and porcelain to metal. The glass tube to be soldered is first covered with a thin coating of platinum or silver, by treating it with a film of platinum chloride or silver nitrate, and heating to dull red. A ring of copper is next electro-deposited on the platinised tube, which can then be soldered like any ordinary metallic tube. Solderings effected in this manner are said to be very strong. The top of a tube attached to M. Cailletet's apparatus for liquefying gases terminates in a soldered end, and successfully resists pressures of over 300 atmospheres.

## THE HISTORY OF PHOTOGRAPHY.*

BY DR. J. M. EDER, DIRECTOR OF THE IMPERIAL PHOTOGRAPHIC INSTITUTE OF VIENNA.

On this basis Schiendl erects that foundation of his "History of Photography with Chromium Salts," and builds a castle in the air to prove what is not really contained in Ponton's communication to the Royal Society of Scottish Artists.†

There is nothing left but to conclude that Schiendl has not, for the purpose of his "History," read the original, for what he has put into Ponton's mouth is entirely an arbitrary interposition.

Equally untenable is the phrase on page 277 of Schiendl's "History": "Ponton, whom we may regard as the *discoverer of the sensitiveness to light of chrome gelatine (!)* . . ." for of the sensitiveness to light of *chrome gelatine* Ponton does not say the slightest word in the before-mentioned communication to the Scotch Society. Ponton dealt in his communication at the time (1839) exclusively with the change of colour of paper steeped in bichromate of potash solution, which became brown on exposure to light, and was fixed by washing. There was not a *word to be found* of what Schiendl relates Ponton to have discovered, that organic substances mixed with bichromate lost in the light their solubility and stickiness, and no longer absorbed water.

All Schiendl's "historical statements" drawn therefrom are therefore erroneous, and this consideration weakens very much the credibility of other statements for which Schiendl is responsible, and of the greater part of which he omits to mention the source. Very many readers will not search through the sources of statements, or do not know where to find them; on that account it is a duty to warn them of such a stumbling block against historical fact, for all such as have not time to study the originals, and who interest themselves in the history of discoveries, purchase a history believing that they may trust themselves to it.

We will, however, give a warning against some other stumbling blocks to historical fact in Schiendl's history.

For the historian, the discovery of the printing process with silvered albumenised paper is interesting, for it has ruled during many decades of photography. I note especially the following statement on page 58 of Schiendl's History: "Farther, *Legray* gives the application of albumen instead of salted paper, a *discovery* which, later on, *Fox Talbot* endeavoured to claim." The author credits *Le Gray* with the discovery of albumen paper, and dates it as *June*, 1850.

This statement of the discovery of a printing process of so much importance to photography is also incorrect, for, earlier than that, *Blanquart Evrard* employed albumen paper for positive printing, and described its properties in a communication to the French Academy of Sciences at a meeting held on *May 27th*, 1850.

In a similar way, Schiendl misdates the publication of the application of hyposulphite of soda as a fixing agent. The author, on page 48, says that *Herschel* recommended this fixing salt in the year 1840, whereas, in fact, this discovery was already made in the year 1839 by *Talbot*, with whom he was recognised to be in frequent communication, and was communicated to the Paris Academy March 1st, 1839.

* Continued from p. 170.

† This is the source on which Schiendl depends, and on which he bases the course of his argument.

The discovery of photography with collodion, Schiendl, in his History (page 57), ascribes to "Legray," whereto I remark that this was thoroughly gone into by me in the year 1884, and the recognition of this priority then made. In so far, I have nothing to say, except that the name should not be written Legray, but Le Gray, and that Schiendl's way of writing it is incorrect.

I must, however, distinctly dispute the language used as that of the first publication on collodion photography (page 57), which is incorrectly rendered. I bring this forward prominently, because Herr Schiendl prints his "citation" with quotation marks, and thereby would induce the reader to believe that he has a literal translation of the original before him. This is, however, by no means the case, although Schiendl expressly professes to quote Le Gray. As this may appear to be incredible, I will give the original communication of Le Gray in his own words, alongside Schiendl's pretended quotation, so that this style of history writing may be characterised:—

| Herr Schiendl's professed Literal Quotation from Le Gray. | Le Gray's Original Communication. |
|---|---|
| "I have, however, discovered a process whereby I produce a photographic picture on glass, by means of *hydrofluoric acid (!)* and fluoride of potassium (or sodium) mixed with alcohol of 40 per cent., together with sulphuric ether, and afterwards with thick collodion. A film of this kind is spread upon glass. I afterwards treat it with *nitrate of silver*, and can obtain a negative in the camera with an exposure of *five seconds* in the shade." | "Je travaille dans ce moment, un procédé sur verre par *l'ether methyl fluor hydrique*, le fluorure de potassium, et de soude, dissous dans l'alcohol à 10 mêlé à l'ether sulfurique, et saturé ensuite de collodion. Je fais ensuite réagir *l'aceto nitrat d'argent*, et j'obtiens une épreuve à la chambre noire en vingt seconds a l'ombre."* |

From this comparison it is seen that Schiendl's "original quotation" contains four errors:—

1. Herr Schiendl tells us that Le Gray employed *hydrofluoric acid*; Le Gray, however, expressly said "*methyl* hydrofluoric *ether*."

2. Herr Schiendl writes, "fluoride of potassium *or* sodium," whilst it should be fluoride of potassium *and* sodium.

3. Le Gray employed "*aceto*-nitrate of silver," and not "silver nitrate," as Schiendl tells us.

4. Le Gray only obtained his result with an exposure of *twenty* seconds, and not *five* seconds.

There is a great difference between "methyl-hydrofluoric ether," which is the substance mentioned in the original, and the old well-known hydrofluoric acid. The correct rendering of this point is important, because the "methyl-hydrofluoric ether" which Le Gray recommended was quite unknown; and so that the original receipt was practically impossible to be followed. A *History writer*, however, must by no means forcibly turn aside the meaning by arbitrarily altering the language of the original document, and all this under the flag of a literal translation with quotation marks.

*(To be continued.)*

* *Direct Translation from the French.*—I am working at present at a process on glass with methyl hydrofluoric ether, fluoride of potassium, and of soda, dissolved in alcohol of 40°, mixed with sulphuric ether, and afterwards saturated with collodion. I afterwards treat this with aceto-nitrate of silver, and I obtain a negative in the camera in twenty-five seconds in the shade.

## TESTING THE SENSITIVENESS OF COLOUR-SENSITIVE PLATES.

BY DR. H. W. VOGEL, BERLIN.

In your valuable journal of January 30th, page 81, you mention an article by Mr. N. Schumann, entitled, "Determining the Sensitiveness of Photographic Plates by means of the Spectrograph," printed in the *Chemical News*. The article is an abstract of a series of special publications upon the same subject in the *Photographische Correspondenz*, 1889. Though many of the assertions of Mr. Schumann in those articles seem strange coming from an experienced investigator in colour-sensitive plates, I made in 1889 only a few objections.* If I answer now more specially, it is for the reason that Mr. Schumann repeats his erroneous notions, and seems to believe in the sentence, "*Quis tacet consentire videtur*" ("Who keeps silence seems to consent").

The strange assertions Schumann makes are: (1) The sensitiveness of silver eoside plates for the yellow and blue rays of the spectrum of the sun at high altitudes (summer season, noon) is equal; (2) The sensitiveness of the same plates for the same rays of the spectrum of the *blue sky* or the clouds is also equal. These assertions are really puzzling.

A glance into the spectroscope shows us that the yellow and greenish yellow part of the solar spectrum is so intense that the human eyes cannot bear it, whilst the blue part can be easily observed. On the other hand, the yellow part of the spectrum of the blue sky is so mild that it can be observed without injuring the eyes. Therefore, it is obvious that the quantity of yellow rays *in relation to the blue* ones is by far greater in the sunlight than in the blue sky light. In spite of this fact, Schumann tells us that the action of both coloured rays should be the same in both cases.

Not alone eye observations, but also photographic observations, inform us how different are the actions of the blue and yellow parts of the solar spectrum, and of the spectrum of the blue sky. I have before me a great number of spectrum negatives from the sun and the blue sky, taken on *ordinary* plates at the same time. They show that an exposure of a quarter of a second to the sun will give, in the blue part, about the same intensity as four minutes' exposure for the blue sky; but whilst the action in the solar spectrum reaches the yellow (line D), the action in the blue sky spectrum ceases near F. This proves beyond doubt that sunlight contains really more yellow rays than does the blue sky. From this, it is obvious that if, according to Schumann, in the solar spectrum blue and yellow act equally on silver eoside plates, the action of the blue in the sky spectrum must be more intense than the yellow. Therefore, I conclude that Mr. Schumann's method of measuring the relative action of blue and yellow in the spectrum gives totally wrong results.

Schumann says that "to find the behaviour of plates towards any source of light, a series of spectra with regularly increasing times of exposure should be photographed, and the dried plates be examined in regard to the time required to produce a developable impression by different colours.† The different sensitiveness will then be found to be inversely proportioned to the time of exposure. *The intensity of the plate is of no importance.*"

* *Photographische Mittheilungen*, xxvi, p. 240.

† Photographic News, page 81.

Of no importance? I think the first weak impression upon which the observation depends is more easily perceptible when the intensity is greater. Of greater importance is the fact that the nature of development of a colour-sensitive plate is quite different from that of an ordinary one. This Schumann has entirely overlooked.

I published in the *Photographische Mittheilungen*, vol. xxvii., p. 63, a singular observation about the development of silver eoside plates. If such plate is exposed to a colour table and developed in any way slowly, the blue parts appear first; they increase in density; the yellow parts make their appearance later; they are at first thinner than the blue parts, but soon they increase in density, and often, according to the nature of the daylight,* at the end of the development they are denser than the blue parts. If the plate is turned over, it is easy to observe that the action of the yellows on the back is more visible than the action of the blues, proving that, under development, the yellow has penetrated the film more than the blue.

It is easy to explain this. The quantity of bromide of silver contained in a plate 5 by 7 inches, according to Eder, averages 0·417 gramme (French weight). The quantity of eoside of silver in the maximum case is 0·00018 gramme. From this it follows that the film contains about 400 molecules of bromide of silver to 1 molecule of silver eoside; therefore a white ray going through the film will affect 500 molecules of bromide of silver, and, at the same time, only 1 molecule of eoside. The blue ray acts only on the bromide because the blue is freely absorbed thereby; the greenish-yellow ray acts primarily on the eoside, which absorbs it, and this action is transferred to the neighbouring bromide molecules. It is obvious from these facts that the action of the blue on a silver-eoside plate begins first, the action of the yellow later, and more deeply in the film, as confirmed by the experiment above described.

The action of the blue increases in intensity by longer development before the action of the yellow is brought out.

For this reason, it is totally wrong to try to determine the numerical values of the sensitiveness for blue and yellow of silver eoside plates by the times of exposure necessary to make the first visible impression by the stated coloured rays.

The puzzling results of Schumann, who finds the action of blue and yellow equal, not only in the solar spectrum, but in the spectra of the blue sky, and even of dark clouds, are now explained. If Mr. Schumann says "all sensitometers have been superseded by the trustworthy spectrograph," I answer yes, but that the style in which Mr. Schumann uses the spectrograph is not trustworthy at all. Another method must be employed—that is to say, the principle first introduced in photo-chemical practice by such eminent men as Bunsen and Roscoe, in their pendulum photometer (*Poggendorff Annalen*, v. 124, p. 353). Both investigators observe not the beginning of the action (on sensitive paper), but the time necessary to produce a certain degree of blackness; the shorter the time for producing the required darkening, the more intense is the incident light.

The same principle is employed by Janssen for determining the chemical intensity of starlight. He makes

* Boissonnas and I have shown that a sky with clouds yields yellow rays remarkably more intense than it does the blue ones, whilst a pure blue sky gives the yellow rays with less intensity. (*v.* Eder's *Jahrbuch*, 1890.)

comparison pictures on the same plate, one from an artificial star, and then others by different exposures from a real star on the same plate; then he determines how long the exposure is for bringing out a star image of the same intensity as the artificial star. Exactly the same style of determining the sensitiveness of dry plates is proposed now by the *Congress International de Photographie* (*Rapports et Documents*, Paris, 1890, p. 72). I have employed the same method for determining the relative sensitiveness to blue and yellow rays of silver eoside plates, by exposing the said plates one. two, three, four, five, ten, and more seconds to the solar spectrum, and comparing the intensity of the different spectra in the regions of the maxima λ λ 450 and 580. If I find that I must expose ten seconds to get the same intensity in the blue as I get in the yellow in one second, then I say that the plate is ten times more sensitive to yellow than to blue. Such plates really exist.

Mr. Schumann reproaches me for having employed in these experiments a small spectrograph, whose set of prisms (of flint and crown glass combined) absorbs many of the blue rays. He accused me in Scolik's "Handbook of Photography with Emulsions" with having deceived in this way the photographic public to gain favour for the silver eoside plates. I have answered this very low and ignoble suspicion in my *Meittheilungen*, and declared that I have never used my small spectrograph with the mentioned prism set for determining the relative *quantitative* action of blue and yellow, or any other coloured ray. I would not have mentioned this fact again; but, inasmuch as I see that Mr. Schumann now publishes extracts from his special papers in English journals with special regard to my researches, I am obliged to do so. I employ for such researches only my large spectrograph fitted with two white flint prisms, which transmit the blue rays better than does crown glass.

Mr. Schumann tries to refute me with my own words,* printed in my "Hand-book of Photography" (third edition), when speaking of the intensity and sensitiveness of *wet* collodion, explaining that there are collodions giving very dense images, but which are less sensitive, and *vice versa*; but I have accentuated that these facts are true only for *wet* plates. "With dry plates the conditions are quite different." This sentence Schumann has not mentioned, though it is printed on the same page (92) as the above-mentioned sentence. Afterwards he charges me with "conscious inaccuracy." I despise this style of controversy as unworthy a scientific man.

Professor Meldola's first lecture at the Society of Arts on "Photographic Chemistry" will be delivered next Monday night at eight o'clock.

Prints with Salts of Uranium.—If a piece of paper be coated with nitrate of uranium and then exposed under a negative, a very faint impression will result, owing to the formation of uranous oxide. On immersing the paper in a bath of nitrate of silver a black image will immediately be obtained, owing to the precipitation of metallic silver upon the uranous oxide. In this case the silver nitrate acts as the developing agent. Prints obtained in this way must be fixed in a weak bath of hyposulphite of soda. If, however, the silver nitrate be mixed with the nitrate of uranium, we obtain a direct printing-out paper, which only needs to be fixed in hypo to become permanent. If in lieu of nitrate of silver we use ferricyanide of potassium, a chocolate brown to reddish picture will be obtained.—J. H. Stebbins, Jr.

* *Photographische Rundschau*, 1890, p. 572.

## THE FEDERATION OF LONDON PHOTOGRAPHIC SOCIETIES.

Last Monday night a meeting of between twenty and thirty representatives of photographic societies was held in the rooms of the Photographic Society, 50, Great Russell Street, London, which meeting had been called by a circular which we published last week, and which had been issued to the London and suburban photographic societies by Mr. Lewis M. Biden. The object was to consider the federation of London and suburban photographic societies.

Mr. Biden took the chair, and read the circular convening the meeting. He added that he had received numerous replies to the circular, and not one of them otherwise than favourable; almost all of them had promised to send representatives that evening. He considered it to be of little importance whether they called the scheme "federation" or "association"; the object was the union of societies for mutual help. For instance, the secretaries of many societies had difficulty in filling up their lecture list or to get papers; yet there were people who were willing to prepare papers with experiments if they knew that they would have a larger number of listeners than is usual at the meetings of local societies; but they did not care to give all this time and work for an auditory of, perhaps, twenty persons. One object of the federation would be to see that such time was not thrown away, by making arrangements whereby the author could read his paper before more than one society. Another object of federation would be to try to obtain special travelling facilities for photographers. If all the societies combined, they might be able to guarantee to the railway companies the sale of a certain number of tickets, or might get the privilege of going by one railway, and, after walking across country, returning by another line. The federation might deal with the collection of lantern slides, and the lending of them to the different societies in turn; it might also consider the question of the proposed Photographic Institute, and of alliance with the Photographic Society of Great Britain.

Mr. W. A. Brown, Pres. of the West London Society, said that the question of federation had been before his society at the last meeting, and the hon. secretary and himself had been deputed to attend that evening, and to report after learning what federation meant. He thought that any federation would be incomplete unless the larger photographic societies joined therein; without them, it would be useless to attempt to take any step in the matter. If a federation could arrange for an interchange of honorary lecturers, it would be a manifest advantage to all the societies. He did not know anything about the Photographic Institute.

The Chairman thought that Sir H. Trueman Wood or Dr. Lindsay Johnson would give the federation information on that point, if invited.

Mr. Brown continued that he thought that it would be a great advantage to the other societies to enter into alliance with the Photographic Society of Great Britain. The secretary to the West London Society had sent out to London photographic societies about fifty copies of a memorial for presentation to the London railway companies, requesting a reduction of fares to photographers; all the replies received were favourable, with one exception. Such a scheme was clearly a matter for a federation to take up, for no single society was strong enough to influence the railway companies, for the simple reason that if the directors granted the facilities, they would have to explain to the shareholders that commercial advantages resulted from so doing; in this matter the societies would clearly be stronger by union. That evening, he thought, they could but discuss general principles, and not go into rules or details. The societies want to know what good a federation will do for them, and how much it will cost.

The Chairman thought that they were hardly in a position to consider the question of cost, especially as they had not yet sufficient information about the number of members of the societies; the question of cost was one which alone could be dealt with at a meeting of officially appointed representatives of all the societies, and such a meeting could draw up a scheme. He would throw out merely as an idea for discussion that perhaps a payment of five per cent. of the gross income of each society, with a reduction for the larger organisations; thus the payment from the smaller societies might be about sufficient to cover the cost of postage.

Mr. H. M. Hastings wished to know whether the London and Provincial Photographic Association would join the federation.

Mr. R. P. Drage said that he was in attendance unofficially on behalf of that Association, with instructions to listen and to report.

Mr. A. Dean, of the Hackney Photographic Society, remarked that that Society once applied to the Great Eastern Railway Company for a reduction of fares to its members, and the Company replied that when the members took not less than twenty tickets they could go second class at third class fares.

Mr. Frank Cherry, of the North Middlesex Photographic Society, was in favour of a federation trying to influence the railway companies, and thought that it would be a good thing if it could get lecturers together.

A representative of the Holborn Photographic Club was invited by the chairman to speak, and replied that he was there only to watch and report.

The Chairman remarked that many others appeared to have attended with similar instructions. Any resolutions passed that evening, it should be clearly understood, would bind no society to anything. He then moved "that it is desirable to form an association or federation of societies and clubs whose members are interested in photography."

There was a large show of hands in favour of this resolution, and none against.

The Chairman next moved "that the London and suburban societies be requested each to send two delegates to discuss, and to appoint a committee to make the necessary arrangements, to settle the name, and to draw up the constitution of the proposed association, with terms of membership, &c.; such delegates to continue to act for a period not exceeding six months from the launching of the association."

This was passed without a dissentient.

The Chairman then moved that the following be the objects of the association:—(1) The association or federation of the London societies; (2) the interchange of lectures, papers, lantern slides, &c.; (3) as to obtaining the reduction of railway fares to photographers on their outings; (4) whether any proposal can be made to the P. S. G. B. for admission of the various societies as corporate members of the P. S. G. B.; (5) generally to promote photographic knowledge and research.

Mr. Brown asked whether the Photographic Society of Great Britain intended to join the federation.

The Chairman did not know, but he thought that federation would give an opportunity for the younger members of societies to assert themselves. The federation might invite the Photographic Society to join.

Mr. Debenham, speaking in his private capacity, said that the federation could not well invite the Photographic Society to join until the federation could tell the Society in what it was proposed that it should take part.

Mr. Brown wished the Photographic Society to be inside the federation, and at the head of it. Unless the Photographic Society would take part, he did not see the use of entering into federation at all.

Mr. White, of Ealing, moved, and Mr. Rumble, of Sydenham, seconded, "that the Photographic Society of Great Britain be requested to send representatives to the next meeting of delegates."

This was carried by a large show of hands.

The Chairman again remarked that it was clearly understood that the societies represented at that meeting were not bound by anything which had taken place that night.

The meeting of delegates was then fixed for Monday, the 23rd of March.

---

*The Eye*, Chicago, says that the Czar of Russia, on the occasion of the birthday of the Czarina, presented her with a beautiful album of views taken of the most beautiful spots in Russia and Denmark, from negatives taken by himself.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

COLLOTYPE SIMPLIFIED—INTENSIFYING NEGATIVES—LIPPMANN'S HELIOCHROMIC METHOD—TRANSFERS ON STONE WITHOUT GRINDING OFF THE FORMER IMPRESSION.

*A Simplified Method of Collotype.*—Mr. A. V. Lavroff, the editor of the Russian *Amateur Photographer*, gives, in a letter to the editor of the *Photographisches Wochenblatt*, the description of a simplified method of the collotype process, which is in some respects different from that published recently by M. Balagny. A plate-glass is prepared in the usual manner with bichromate of potash, exposed beneath a negative, developed with cold water, and then allowed to dry for twenty-four hours at about 70° F. It is next covered with the following etching solution:—

| | |
|---|---|
| Water ... ... ... ... ... | 100 c.c. |
| Glycerine ... ... ... ... | 200 ,, |
| Hyposulphite of soda ... ... ... | 2 grammes |

This solution is allowed to remain on the plate for one or two hours, according to the relief desired, when it is removed by the aid of a very soft sponge and blotting-paper, and the ink applied by means of a gelatine roller. To take prints in the ordinary copying press, the plate-glass covered with the ink is placed upon a piece of india-rubber cloth: upon the glass is laid a mask of paraffin-paper, then the printing paper, and finally a thin pillow of fine cloth, filled with cotton wool, and provided with a case of soft, smooth silk. This pillow enables the operator to press the paper into close contact with the plate, and so to obtain all the fineness and detail of the negative. If, after about twenty prints have been taken, the bichromate image begins to become grey at the light parts, it is only necessary to apply the etching fluid with a soft sponge, in order to restore the cliché to its former vigour. Mr. V. Lavroff states that by this method anyone can take hundreds of prints at moderate cost and without a special machine, a little experience and exactness being all that is required. The author has taken a thousand prints from a good printing plate, and he says that it is possible to take from ten to twelve prints within five minutes. Farther working details and particulars are promised by the author.

*Intensifying Negatives.*—Negatives intensified with chloride of mercury often become yellow-stained. To prevent this evil, Mr. Riesenkönig recommends the following method as a thoroughly trustworthy one. A strong solution of sublimate is taken and poured on the negative in the same manner as in the case of wet collodion plates; the plate is slightly moved, and then *at once* thoroughly rinsed with water. The blackening of the negative is accomplished in the usual manner. A negative treated in this way will always be perfectly clear and brilliant.

*Remarks on Prof. Lippmann's Heliochromic Process.*—In this country Prof. Lippmann's new discovery has created widespread interest, and almost all the photographic periodicals have translated the articles relative to it from English and French journals. Dr. F. Stolze, editor of the *Photograph. Nachrichten*, whom we esteem as one of our ablest authorities in photographic matters, referring to an article reprinted from the *Vossische Zeitung*, says that, with regard to the explanation of the actual phenomenon, the physical theory which is said to have been successfully embodied in experiment will not at all stand the test. It has been stated, he continues, that the colours in question are dependent on the phenomena of interference, and that the latter, so to say, are fixing the wave lengths of the colours in the sensitive film in the same way as the human voice is fixed on the cylinder of the phonograph. This sounds well, but it disagrees with our physical knowledge. It is true the colour of thin films, if viewed by transmitted light, is complementary to that appearing if viewed by reflected light; but colours altogether make their appearance only in the case of very minimal thicknesses of the films, and will disappear as soon as the thickness amounts to more than a minute fraction of a millimetre—in the case of atmospheric air, for instance, if it amount to more than 0·001 millimetre. In Prof. Lippmann's experiments, however, glass plates are coming into consideration, which, in most cases, will have a thickness of from two to three millimetres, and with which it will therefore be impossible to perceive the phenomena in question. Besides, it should be borne in mind that the spectrum comes into consideration, *i.e.*, monochromatic light at every single point. With the latter, the varying thicknesses of the film give rise to a more distinct luminosity and obscurity, the two interfering light-waves either reinforcing or counteracting one another. But this does not mean that certain points of the sensitive film are not at all disturbed, and others highly disturbed, so that consequently an opportunity is offered that at one point of the film a reduction of silver takes place during development, and at the other one not, but only that *all* the points of the film are vibrating more or less. Thus, even if the glass film be sufficiently thin to produce interference, it would be impossible that these luminous and obscure fringes should be produced in the film, as indicated above. But it would be even more unintelligible that plates, having really such fringes, should show complementary colours if viewed by reflected and by transmitted light, for all the conditions which produce this phenomenon on the actual examination of thin films are wanting here. Provided that the wave lengths be really, so to say, depicted in the layer, even then but one colour would be perceptible, either by reflected or by transmitted light. But, besides this, there is a much more important circumstance which should be borne in mind: by homogeneous, monochromatic light, which alone comes into consideration in the case of the spectrum, thin plates show the same colour by transmitted as by reflected light, and the difference consists simply in the fact that if, in consequence of the thickness of the film, reflected light appear more luminous, transmitted light will turn out more obscure, and *vice versa.* With regard to this point, therefore, the phenomenon, as indicated by Lippmann, is in direct contradiction to the physical phenomenon, and from this it will be evident that the explanation given is unsatisfactory. Dr. Stolze then suggests the backing of the glass plates with any black medium for positive examination, and to use them without backing for negatives. From such negatives, says the author, diapositives in any number could be produced, which again would serve for the production of positives for examination by reflected light. In the *Photographische Mittheilungen* Prof. Vogel credits Dr. Zenger with the first application of this method to heliochromic researches. The latter investigator is said to have used it many years ago at the time of collodion plates, but to have given it up as unsatisfactory.

*Transfers on Stone without Grinding off the Former Impressions.*—In a previous letter I mentioned a newly patented process of a German firm, consisting in making transfers upon the lithographic stone without grinding off the former transfer which had been made on it. Having received some inquiries for particulars of the process, I will give here the working details as far as it was possible to become acquainted with them. The new process is not only more simple than the old one, which required the grinding off of the former transfer, but it renders it also possible for the stone to be preserved ready for employment again without being ground off, so that it can be used for a much longer time than a lithographic stone treated after the old method. The working details are described as follows:—The stone is rendered sensitive to grease by treating it with sulphate of aluminium. The picture is then transferred to it; after this, the transfer paper is carefully loosened, and the stone well gummed, allowed to dry, and then freed from the gum by washing. The stone is then at once inked up with ordinary lithographic ink, dusted with resin powder, etched, and once more gummed. It is then ready for printing. When it is desired to use the stone for a new impression, the transfer is washed off with turpentine, and any grease which may have been left in the stone is removed by the use of acid. Thus the stone is again rendered sensitive to grease, so that it may receive a new impression without being ground previously. From ten to twenty minutes are said to be sufficient to make a stone ready for use anew, no matter of what size it may be, whilst with the old method the grinding off of larger stones required up to five hours. By this treatment the stone receives a polish, not as in the case of grinding, but a very fine grain which retains even the finest line or point, and which reproduces it equally finely.

---

Liquid Glue.—A good liquid glue, always ready for use, is made by filling a small jar with glue of good quality, broken up fine, and then filled with acetic acid. Keep the jar in a vessel of hot water for a few hours until the glue is all melted. It is always ready for use.

The Camera Club.—The dark rooms at the Camera Club are now available for members, and luncheons and dinners are now being served daily on the premises. The library and large club-room are open, and the Club's registered telegraphic address is "Monochrome, London." On Monday, March 16th, at 6 p.m., annual general meeting; at 8.30 p.m., lantern exhibition; slides by Mr. Fitz Payne (North Holland and Friesland), and by Mr. Stevens and other members. Thursday, March 19th, 8.30 p.m., Rev. T. Perkins, M.A., "Farther Notes on Church Architecture," illustrated by lantern slides. Thursday, March 26th, 8.30 p.m., informal meeting. Thursday, April 2nd, 8.30 p.m., Mr. Henry Sturmey, "Norway as a Field for Photographic Work," illustrated. In relation to the Conference week:—Monday, April 6th, 8.30 p.m., opening of the members' annual exhibition of photographs; open for about six weeks; visitors admitted by ticket or card from the hon. secretary and from members; smoking concert—the first in the new rooms. Tuesday, April 7th, 2 p.m., opening of Conference by the president at the Society of Arts; papers from 2 to 5.30 p.m., meeting and discussion open to all; 8 p.m., lantern slide exhibition in the Theatre, Society of Arts; special tickets required for this meeting. Wednesday, April 8th, 2 p.m., renewal of Conference at the Society of Arts; papers from 2 to 5.30 p.m.; 7.30 p.m. precisely, annual dinner for members and friends at the Criterion Restaurant. Thursday, April 9th, 8.30 p.m., ordinary meeting; flash-light demonstration with Messrs. Marion & Co.'s apparatus; other apparatus will be shown. Monday, April 13th, 8.30 p.m., extra lantern evening; members are requested to bring slides. Thursday, April 16th, 8.30 p.m., Mr. J. Howson, "Conventionalism in Colour." Thursday, April 23rd, 8.30 p.m., Mr. Frank Howard, "Photography in Bye-Paths and Field Lanes," illustrated by the lantern.

## PHOTOGRAPHY AT HARROGATE.

A meeting of the Harrogate Naturalist and Scientific Society was recently held in No. 3 Room, People's Hotel, Harrogate, the President (Dr. A. G. Russell, J.P.) in the chair, when a lecture on "The Chemistry of Photography" was delivered by Mr. A. A. Pearson, of Leeds. There was a crowded attendance, and the numerous experiments with which the lecture was illustrated enhanced the value of the paper.

Mr. Pearson said that the whole science of photography depends on the fact that certain substances are acted upon by light. We all know how the sunlight bleaches the colours of our carpets, curtains, and upholstery, though very slowly; the bright aniline dyes with which many silk ribbons are dyed lose their colour more quickly. The market gardener is unconsciously familiar with this property of light. He sows a bed of lettuce seed; when it comes up he thins it into rows, and, by the time the plants have grown a few good-sized leaves, he ties them up at the top to exclude the light; the result is a crisp, pale heart, the outer leaves of which are a pale green where the light has filtered through, yellow where less light has penetrated, and in the dark centre pure white. In the same way, he blanches his celery by banking up with soil. The green colouring matter of vegetation is a compound called chlorophyll, which is only formed in the presence of white light, so that here we have colour formed by light; whereas, in the case of dyes, the colour is destroyed by light. These processes are very slow, extending to days and weeks, but there are certain metallic salts, notably some of the salts of silver, which show a visible colour change in sunlight in a few seconds, and furthermore undergo an invisible change (which can, however, be rendered visible by the action of certain chemicals termed developers) in less than the 500th part of a second; nay, I have a photograph that I took of a single spark from a high tension electrical machine which cannot have lasted the 5,000th of a second. You will agree with me that it is a wonderful thing that a substance which keeps indefinitely in the dark, and remains unaltered a considerable time in a red or yellow light, should have its nature changed by exposure to white light for a shorter time than it takes you to wink. It is my purpose to-night to investigate this change, and explain its theory. In order to do this, I shall perform some experiments in visible changes, and argue from the visible to the invisible; just as when we see tree branches waving, or a hat scudding away from its owner, although we cannot see the disturbed atmosphere, yet we know there is a current of air in rapid motion, which we call wind.

After speaking of more elementary photographic matters, the speaker thus expressed his opinion about the disputed subject of the nature of the invisible photographic image:—

Let us see what happens when a ray of white light meets the extremely sensitive film of silver bromide. The ray of light is composed of several colours, from red to violet, and some invisible rays beyond that; the red vibrates the slowest, the violet and the ultra-violet the quickest. Those vibrations which do not correspond with the vibrations of the atoms of bromide are reflected, and we see them as reflected light; those that do correspond penetrate the film and amplify the movement of the atoms to such an extent as to loosen the bonds of affinity, and they are ready to fly apart on small provocation, like the iodide of nitrogen. To prove that a vibrating body will affect another one which is in unison with itself, I will return to the tuning-fork. I have another fork which is in exact unison with it. When I draw the bow across the first one, the second one is thrown into synchronous vibration, and sounds with it, and the boxes on which they stand infinitely reinforce the sound by vibrating in consonance. This would not occur if they were the least bit out of tune with each other. A very similar action seems to take place when the white light strikes the film of silver bromide and gelatine. A portion of the bromine appears to be set free, leaving the molecules in a very unstable position at the mercy of the developer. This is where the gelatine plays its part by absorbing the liberated bromine, for, as I explained before, single atoms cannot exist, but must have their affinities satisfied by company with other atoms, either of their own kind or others, they can combine with to form molecules. In certain cases, however, their loosened bonds can be loosely held together by the presence of a third substance, which, in this case, is the gelatine. The gelatine does not combine with the liberated bromine, but absorbs it in such a manner as to prevent the structure giving way. When the developer is applied, it acts by robbing this mainstay of liberated bromine and all the other besides, and the edifice tumbles to pieces, leaving nothing but metallic silver, which forms the image.

I have now only to conclude with a summary of the theory of the action of light on a sensitive dry plate in the process of taking a negative, as advanced by Captain Abney, Dr. Eder, Carey Lea, and others, and then bring this paper to a close by exposing a plate under a negative, and then placing it in a developing cell in the lantern so that you can see the development take place on the screen. First of all, our dry plates consist of a gelatine film in which is incorporated a compound of bromine and silver—the component atoms of this compound are in a state of vibration like a tuning fork, but infinitely more rapid; a ray of light formed of the subtle elastic ether, also in rapid oscillation at several different speeds, just as the air is when several musical notes are when sounded at once, partially penetrates this film and augments the movements of the atoms of silver bromide that are in tune with it to such an extent that the attraction is loosened, and some of the bromine is liberated and absorbed by the gelatine, leaving the molecules in a very shaky condition. The developer is applied which appropriates that absorbed bromine, and proves the last straw to the camel's back, for the structure breaks down, leaving more or less opaque metallic silver behind to form the visible image. The unaltered silver bromide is then dissolved out.

## THE SCIENCE OF COLOUR.

Last Friday, at Capt. W. de W. Abney's third lecture on the above subject at the Society of Arts, Mr. Francis Cobb presided.

Capt. Abney, by means of the colour-top, matched the colour of brown paper by means of four sectors—black, white, green, and bright red; these, when spun round, gave a brown paper colour. On another disc he had colours so painted that, when the disc was spun, it gave a fair representation of a spectrum, with the colours in their proper order. Pieces of coloured glass were spun round in a beam from the electric lamp, and gave a good imitation on the screen of a true spectrum; indeed, Captain Abney stated that it could be used as a spectrum in certain lecture experiments. He next spun a piece of the *Sporting Times* newspaper—usually, he believed, called "The Pink 'un"—with a sector of green paper bought at a stationer's shop; white was the result, and, he said, when two colours produce white they are complementary colours. Lastly, he described and experimentally illustrated a method of mathematically registering any colour whatever in terms of the wave-length of light; for instance, by these numbers anyone, he said, could, a thousand years hence, test the carmine of that day, and say whether it is exactly the same in colour as the carmine of to-day.

The Education Code and the Decimal System.—A deputation from the Decimal Association last June presented a memorial to the School Board for London, praying that the metric system should be taught in the fifth standard, and that decimal fractions should be taught in the fourth standard at latest. After due consideration the Board petitioned the Education Department to make the necessary provision in the new code, and this was subsequently supported by thirty-seven other School Boards. The Education Department has inserted the provision desired, the following foot note having been appended to Schedule 1: "The scholars in standards five, six, and seven should know the principle of the metric system, and be able to explain the advantages to be gained from uniformity in the method of forming multiples and sub-multiples of the unit. As a preparation for this, it will be useful to give in standard four elementary lessons on the notation of decimal fractions."

## Notes.

This week the subject of the smoke of London came before both Houses of Parliament on the same night, but nothing practical was done, perhaps because the Bill before the House of Lords was too drastic; it sought to make it compulsory on every householder to use smoke-consuming grates. There is no absolutely smoke-consuming grate, but plenty which will not send three-fourths of heat from the coals and volumes up smoke together up the chimney. Those natural enemies of the human race, ignorant jerry and other builders, are responsible for a vast proportion of the sickness and discomforts of those who dwell in towns; with the rooted conservative instincts of uneducated men who follow small mechanical trades, they build as their fathers did before them; ugly houses consequently arise, containing rooms without ventilation, bad drains running under the ground floor to cause sickness and death in the families of the tenants, aud they put in each room a grate as antique as Noah's ark, a grate which wastes fuel, and promotes the evolution of smoke. If legislation can be made to touch these men, and to prevent their misdeeds in the future, it would be good; otherwise the formation of an association to hang a few of them to the nearest lamp-posts seems a suitable remedy. Cannot *The Builder* newspaper do something to increase the intellectual capacity of the jerry builder? Photographers suffer commercially from smoke, because it cuts off so much light in the winter months.

Last Saturday, Lord Rayleigh exhibited, in one of his lectures at the Royal Institution, a column of mercury standing unsupported seventy inches high in a barometer tube, or at more than double its normal level. This was due to the play of cohesive forces. The bore of the tube had been made chemically clean, and all bubbles, even those of microscopic size, eliminated from the mercury. It was a most difficult experiment, and had been long in preparation before the result was publicly exhibited. In the same course of lectures, he mentioned that, in comparative experiments, it is sometimes necessary in a subsequent experiment to place an object, say a flask, in exactly the same position in relation to surrounding objects as in the preceding experiment. This can be done without any costly "fitting" by an instrument maker. It is necessary that the object shall have six points of contact. Take a three-legged stool with cylindrical legs, for instance. One of the legs may be placed in a triangular hole, of such a form as produced by pressing the point of a cube into a soft substance; this will give three points of contact. The second leg might rest in a V-shaped groove, giving two other points of contact, and the third leg simply rest on the floor, as the sixth point of contact. This stool can then be removed, and afterwards replaced in exactly the same position. These principles, he said, may appear trivial, but they are sometimes of considerable use in experimental research.

The remark is not unfrequently made that pyrogallol is not the easiest developer to work in the production of lantern slides, but that when good slides are turned out by its aid, they are superlatively good. Mr. Goldby is obtaining excellent results with pyro in the shape of rich and delicate purple tones, by means of the formula which he published in these pages last week. He has obtained the same rich purples with three separate brands of gelatino-bromide lantern plates now in the market. To get the purple tone the exposure must be about right; with too short an exposure a black image results, with too long an exposure the resulting image is too red. Mr. Goldby is a skilled chemist, and his published experimental results are thoroughly trustworthy.

Mr. Clarkson has patented an improvement upon the ordinary *Bourdon* pressure gauge, by which he claims absolute immunity from accidents by such ruptures—or explosions one might almost call them—to which we have lately more than once adverted. The matter is of such great importance, now that the gauge is used by so many workers, that we need make no excuse for once more making reference to it. Most people are aware that the principal feature in the gauge is a flattened tube bent to a semi-circular form, and that when pressure is admitted to the interior of such a tube it tends to become straighter according to the amount of such pressure, and this movement is communicated to the pointer which traverses the dial. We have already noted, by reference to one or two recent accidents, that this tube may, from age or other cause, give way, and that the sudden outrush of gas may lead to serious disaster.

Mr. Clarkson's improvement consists in filling the tube with a semi-solid substance, such as soft soap. The pressure of the gas upon this substance allows the tube to expand just as if it were not there, while in case of rupture the outrush of gas is quite prevented by another addition to the apparatus. This is a small metal plunger which is buried in the soap at that part of the gauge which screws upon the gas cylinder. Should the tube above give way, the pressure of the gas drives this plunger forward, so that it at once plugs the entrance to the tube, and effectually cuts off the gas supply. We understand that existing gauges can be fitted with this new form of *Bourdon* tube without great expense.

The Home Secretary's new Bill, the object of which is to deal with several matters relating to criminals and penal servitude, cannot, it will be thought by our readers, have any kind of interest for the photographic fraternity—unless, perhaps, any wanderer with the camera should be mistaken by an over-zealous officer to be "a suspected person frequenting any canal, wharf, or place of public resort with felonious intent." But taking a photograph is not yet a punishable offence—except iu France; yet there is a clause in this Bill which deals with matters photographic, for it proposes that, under certain circumstances, prisoners shall be photographed before conviction. This clause is likely to raise up much opposition from those peculiarly constituted persons who are so fond of championing rascality.

---

While the authorities are considering this matter, it would be as well if they also paid some attention to another important point in criminal photography. We allude to the necessity for photographing a man's hands as well as his face for purposes of identification. It is well known that, while faces are so often alike that one man may be readily mistaken for another, the lines on no two hands agree. How often has the novelist relied for identification upon the impression of a dirty thumb-mark; and the novelist is right. A good photograph would not only show these surface marks, but would detect other peculiarities of structure, and modifications caused by labour and work at different trades. Will not some member call attention to this important matter when the Bill comes on for discussion?

---

California is the favoured spot for the construction of observatories. In addition to the Lick Observatory, there are no less than five others constructed, or in process of construction. Prof. Pickering contemplates building one to contain the great photographic telescope of 24 in. diameter, the cost of which was defrayed by Miss Bruce, of New York. The instrument of Mrs. Procter will be somewhat similar to the portrait lens combination used by Professor Barnard when taking the photographs of the Milky Way, published in the July number of *Knowledge*, but will give pictures on four times the scale of Professor Barnard's photographs. The short focus of such a combination, as compared with an ordinary observing telescope, will enable fainter objects and larger outlying regions of nebulæ to register themselves on the sensitive plates than can be photographed with the telescopes which will be used for the international photographic survey of the heavens, or even with Mr. Isaac Roberts' reflector.

---

As we suggested a fortnight ago, the forthcoming Spectacle Exhibition has had its original scope extended, so that the collection will now comprehend optical instruments of every kind. Indeed, one of the speakers at a special court of the Spectacle Makers' Company, held last week, foreshadowed a rather liberal view of the matter, and it is possible that the schedule may contain certain instruments which cannot be said to be strictly comprehended as exemplifying the optician's art.

---

We believe that the Exhibition is not to be what is called a competitive one. There will be no prizes, and foreign firms, it is stated, will not be invited to exhibit, though importers who trade with England may be accorded the privilege of being allowed to take part. We are afraid this distinction will be the cause of a little heartburning, and perhaps the matter may be considered once more. Surely English manufacturers would like to see what their Continental rivals are doing. It is said that foreign competition has, of late years, affected the English optician. How the matter is to be mended by excluding foreign productions from the Exhibition we do not quite see. It is gratifying to note that the Astronomer-Royal accepted the invitation to be present at the meeting mentioned, and made a very practical speech on the subject.

---

Already M. Lippmann's discovery has sounded a note—a feeble one, it is true—of alarm on the part of a contemporary, representing the printing trade. If the news is true, remarks the journal in question, though it has nothing, of course, with the interests of true art, there is a section of our artists who may be moved to strike. Those whose art consists in the nearest approximation possible to the coloured photograph may kick, as the workmen kicked at the introduction of machinery. At the present moment we are inclined to think that lithographers may calmly rest at nights. There is nothing existing in M. Lippmann's discovery to disturb their peace of mind.

---

The retoucher's art has invaded the dark room. M. H. Fontier describes a process of chemical retouching which may be used during development. Its object is to delay the intensification of certain parts, such as the skies or the high lights. When these appear before there is any detail in the shadows, the development must be stopped and the plate washed quickly. It is then drained, and the high lights are touched with a brush dipped in the following solution:—Bromide of potassium, 4 grammes; citrate of potash, 2 grammes; water, 100 c.c. The development is then proceeded with in the usual manner, and as there is a cessation of action in the parts so treated, the development may be pushed without fear in order to obtain the details in the shadows.

---

The *Blackpool Times* has lately shown what it can do in the way of utilising photography. There was a terrific storm at that northern watering-place some time ago, and great damage resulted. During the gale photographs were taken of the sea-front at the moment when huge waves were breaking upon it, threatening to demolish the houses and buildings. These photos were made into excellent Meisenbach blocks, and printed, with a letterpress description of the calamity, on a separate sheet.

---

Human nature is very much alike. Whether in England or in America, men have a dislike to being photographed. An attempt has been made by the *Shoe and Leather Gazette*, of St. Louis, to obtain the photographs of the shoe and leather salesmen of the Western cities generally, and the editor complains that the response to the call for photographs was so slow that the original intention had to be reluctantly abandoned, and the *Gazette* had to be contented with furnishing a score or so.

## PHOTOGRAPHIC SHUTTERS.*

BY FRANCIS BLAKE.

I shall now give the results obtained for speed of a number of well-known shutters tested with the apparatus just described.

1. Common wooden guillotine drop with four rubber bands, 1¼ inch slot passing 1¼ inch lens—1st test, 0·009 s.; 2nd test, 0·009 s. This shutter passes only 50 per cent. of the light which would fall on the lens if it were wholly uncovered during the action of the shutter. Moreover, it is highly objectionable on account of the violent jar it gives to lenses, often reducing the balsam with which they are sealed to a fine powder.

2. *Gregg Shutter.*—In front of No. 3 euryscope lens; spring wound two turns—1st test, 0·034 s.; 2nd test, 0·035 s.

3. *Prosch Extra-Rapid Shutter.*—Attached to the *oo*-euryscope lens; fastest speed—1st test, 0·0028 s.; 2nd test, 0·0027 s.; 3rd test, 0·0021 s. This is a special form of shutter, in which a single narrow radical slot passes across the centre of the lens tube. So little light is passed that I cannot regard this shutter as of any practical use.

4. *Hoover Shutter.*—3D Dallmeyer lens; *d*/0 is the full and *d*/8 the smallest opening.

| | Quickest Speed. s. | Slowest speed. s. |
|---|---|---|
| *d*/0 | 0·058 | 0·195 |
| 1 | 0·043 | |
| 2 | 0·036 | 0·130 |
| 3 | 0·031 | |
| 4 | 0·025 | |
| 5 | 0·022 | |
| 6 | 0·017 | |
| 7 | 0·013 | |
| 8 | 0·008 | |

For want of light, anything less than *d*/3 would be of no practical use, so that the quickest effective speed of this shutter may be placed at 0·03 s., with a range up to 0·20 s.

5. *Hoover Shutter.*—Large size made for Falk, the well-known professional photographer at New York; euryscope No. 6 lens.

| | Fastest. s. | Slowest. s. |
|---|---|---|
| *d*/1 | 0·055 | 0·146 |
| 4 | | 0·096 |
| 5 | 0·029 | |
| 7 | 0·017 | |

6. *Prosch Duplex Shutter.*—3/*d* Dallmeyer lens. Full opening, about equal to *d*/2.

| | Fastest Speed. Strong Spring. s. | Slowest Speed. Weak Spring. s. |
|---|---|---|
| 1st test | 0·0164 | 0·0302 |
| 2nd ,, | 0·0167 | 0·0288 |

7. *Prosch Duplex Shutter.*—Euryscope No. 2 lens.

| Notch. | Strong Spring. | Weak Spring. |
|---|---|---|
| 1 | 0·021 | 0·032 |
| 2 | 0·016 | 0·028 |
| 3 | 0·013 | 0·027 |
| 4 | 0·012 | 0·026 |
| 5 | 0·010 | 0·025 |

8. *Prosch Duplex Shutter.*—*oo*, a euryscope lens; strong spring. The tests with this shutter were very interesting, as they disclosed a second exposure due to the rebound of the shutter wings after closing. Mr. Ed. H. Lyon had been unable to obtain satisfactory pictures with this shutter, and returned it to the makers immediately after the tests. The reputation of Messrs. Prosch and Co. for good mechanical work renders it almost unnecessary to remark that the subjoined results are unique.

| Notch. | | s. | Time from beginning of first to end of second exposure. s. |
|---|---|---|---|
| 1 | 1st exposure | 0·0122 | 0·0262 |
| | Closed for | 0·0036 | |
| | 2nd exposure | 0·0104 | |
| 2 | 1st exposure | 0·0100 | 0·0219 |
| | Closed for | 0·0030 | |
| | 2nd exposure | 0·0089 | |
| 3 | 1st exposure | 0·0084 | 0·0190 |
| | Closed for | 0·0029 | |
| | 2nd exposure | 0·0077 | |
| 4 | 1st exposure | 0·0077 | 0·0169 |
| | Closed for | 0·0031 | |
| | 2nd exposure | 0·0061 | |

9. *Newman Shutter.*—Attached to Beck lens. Property of Mr. W. G. Reed. Set at exposure marked $\frac{1}{100}$ second. 1st test, 0·045; 2nd test, 0·048.

On February 3rd of this year I tested a number of market shutters which were sent to me for the purpose by our president, Mr. Sweet. Of them all it seems to me that for "all around work," where the limit of speed is not desired, the Bausch and Lamb new style is the best adapted to an amateur's use. It is exceedingly well made, and has a very large range of automatic exposures extending up to two or three seconds.

10. *Bausch and Lamb.*—(New style.) Full opening about $1\frac{1}{16}$ inch:—

| Graduated Time. | | s. |
|---|---|---|
| $\frac{1}{100}$ | 1st test | 0·016 |
| | 2nd ,, | 0·018 |
| $\frac{1}{50}$ | 1st test | 0·050 |
| | 2nd ,, | 0·043 |
| $\frac{1}{10}$ | | 0·047 |
| $\frac{1}{100}$ | (½-in. opening) | 0·013 |

11. *Hand Release, Brass Shutter.*—Full opening 1⅝ inch: 1st test, 0·031 s.; 2nd test, 0·029 s. Shutter jars camera badly.

12. *English Two-winged Shutter.*—Two rubber bands. Full opening 1⅜ inch. 1st test, 0·035 s.; 2nd test, 0·034 s. Shutter jars camera slightly.

13. *French Flap Shutter.*—One rubber band. Full opening 1⅜ inch. 1st test, 0·038 s.; 2nd test, 0·035 s. Shutter jars camera slightly.

14. *Single-fan Shutter.*—Full opening 1½ inch. 1st test, 0·029 s.; 2nd test, 0·030 s. Shutter jars camera slightly.

15. *Long Single Slot Shutter.*—Full opening 1¾ inch. One test, 0·052 s.

16. *Round Black Brass Shutter.*—Full opening 1⅛ inch. This shutter was so slow that the ball in both tests reached the box before exposure was finished. I estimate its speed at about one quarter of a second.

17. *Plunge "Patent" Shutters.*—Perken, Son, and Rayment, London. Property of Dr. Tarbell. Fastest speed Notch 5, 0·054 s.; slowest speed Notch 1, 0·064 s.

18.—Haake and Albers, Frankfort, a.m.; Thury and Amey, Geneve 645. Euryscope No. 3 lens, received from Messrs. Benj. French & Co.:—

| | Fastest Speed. s. | | Slowest Speed. s. |
|---|---|---|---|
| 1st test | 0·009 | 1st test | 0·103 |
| 2nd ,, | 0·009 | 2nd ,, | 0·117 |
| 3rd ,, | 0·009 | | |

An exceedingly well made shutter, with a good range of automatic exposure.

*(To be continued.)*

* Continued from page 165.

## M. LIPPMANN'S DISCOVERIES IN HELIOCHROMY.

BY THE RIGHT HON. LORD RAYLEIGH, SECRETARY TO THE ROYAL SOCIETY.

Will you allow me to draw the attention of your readers to the accompanying passage from the *Philosophical Magazine* of August, 1887, p. 158, in which I propounded an explanation of Becquerel's coloured photographs, identical with that which has guided M. Lippmann in his recent experiments. I believe that a similar view had been expressed, unknown to me, at an earlier date by a German worker, whose name I cannot now recall.

"A detailed experimental examination of various cases in which a laminated structure leads to a powerful but highly selected reflection would be of value. The most frequent examples are met with in the organic world. It has occurred to me that Becquerel's reproduction of the spectrum in natural colours upon silver plates may perhaps be explicable in this manner. The various parts of the film of sub-chloride of silver with which the metal is coated may be conceived to be subjected, during the exposure, to *stationary* luminous waves of nearly definite wave-length, the effect of which might be to impress upon the substance a periodic structure, recurring at intervals, equal to *half* the wave-length of the light; just as a sensitive flame exposed to stationary sonorous waves is influenced at the loops but not at the nodes (*Phil. Mag.*, March, 1879, p. 153). In this way the operation of any kind of light would be to produce just such a modification of the film as would cause it to reflect copiously that particular kind of light. I abstain at present from developing this suggestion, in the hope of soon finding an opportunity of making myself experimentally acquainted with the subject."

Becquerel's instructions (*La Lumière*) are so complete that I found no difficulty in repeating his remarkable experiments and in obtaining very good representations of the spectrum. Any doubts that might have been felt as to the operation of stationary luminous waves in a nearly transparent sensitive film were finally removed by the important observations of Wiener, published about a year ago in Wiedemann's *Annalen*.

---

The Royal Institution.—At the general monthly meeting last Monday, with Mr. William Crookes, F.R.S., vice-president, in the chair, the following were elected members of the Royal Institution:—Miss Emily Aston, B.Sc., Mr. Henry Daw Ellis, M.A., Mr. Francis Fowke, Mr. Augustus William Gadesden, J.P., Miss Emily Dora Locock, Signor Alberto Randegger, The Hon. Frederick Hamilton Russell, and Mr. John Wilson Walter. Professor Victor Horsley, F.R.S., will give a discourse on "Hydrophobia" on Friday, March 20th, in place of Professor W. E. Ayrton, F.R.S., who is unable at present to give his promised lecture on "Electric Meters, Motors, and Money Matters."

A New Solvent for Cellulose.—Messrs. Cross and Bevan write to *The Chemical News* that, on dissolving in hydrochloric acid one half its weight of zinc chloride, a solution is obtained (of specific gravity 1·44) which dissolves cellulose instantly, and without sensible modification. The solution of cellulose obtained by heating it with concentrated solutions of zinc chloride may also be diluted with hydrochloric acid without precipitating the dissolved products; but the solution by the new reagent has the double advantage of being instantaneous, and of being prepared, therefore, with the minimum of resolution of the cellulose into bodies of lower molecular weight, which usually attends the somewhat prolonged heating necessary for complete solution in the aqueous solution of zinc chloride.

## THE PORTRAITURE OF THE MOON.*

BY JAMES MEW.

In photographing the moon, the artist will confer a benefit on mankind and upon himself. He will surely experience a certain freedom, an absence of that conventional restraint which hampers him so cruelly in his portraiture of humanity.

Positive and negative advantages alike fall to the lot of the lunar photographer. The latter are as notorious as they are numerous. First, there will be no necessity to travel, in taking the portrait of the moon, in any groove, cut by the hand of fashion through that well-known photographic rock against which the fierce waves of impassioned rhetoric have so often beaten, called, in the descriptive terminology of the trade, retouching; or if retouching must needs be, it will not flatter, and it will not lie. It will be artistic and not adulatory; its work will be in the cause of universal science and humanity, and not a contribution to individual conceit and spleen. It will present, to borrow a sharp saying from one of the fellest of its foes, a likeness, although a photograph; and this because the moon, although, if indeed not a Teutonic moon, a lady, and by this time so very, very old, is little anxious to conceal her age. It is not with her now as it was in those happy days of the infant world in which she flirted with Endymion in the vale of Latmus, a passage of love which has been described at full length by Keats, and by Shakespere in one line telling how she slept with him, and would not be awaked. Little recks Selene now in this age of iron of a pretty portrait, in this scientific age of doubt of her feminine personality, in this age of decadence, wherein no man, may be, is worthy of her love.

Again, nobody is anxiously desirous of a background to the moon. Nobody will fall foul of the unfortunate though elaborate chair, the elegant but much-abused curtain, the book, or the pedestal in the foreground, or in the distance the machicolated castle or the landed estate. None cares to lift the moon out of her sphere of azure to set her in new surroundings, gorgeous though unfamiliar, unsuitable though grand. Nobody, in fine, can complain of a lack of individuality—that all too frequent though not too distinctly intelligible complaint—in the portraiture of the moon. The pale queen of night rules supreme, and cannot by the most maladroit artist be confounded with the lesser stars. The governess of the floods cannot by any perversity of conception be mistaken for anything in the heaven above other than herself.

Draper in 1840, and in 1850 Professor Bond, of Harvard University, in the United States, were among the earliest important exponents of the assistance lent by photography to lunar portraiture. The experiments of Rutherfurd a dozen years ago, of De La Rue, of Vogel, and Janssen, and many later votaries of this watery orb, are well-known to every photographer. The pale, faint, borrowed, cold, and infertile light of this lantern of the evening sky, aided by the conjunctive instrumentality of the camera and the telescope, has revealed, little by little, its secrets, the subject of so much anxious inquiry since the days of Anaxagoras. We see defined with delicacy of discrimination a cinereous surface of pumice stone, diversified here and there by hill and crater, dotted and dashed with lurid discs of light, and with ragged fringes of darkness, with peaks and cones of polished silver, and

* Concluded from page 164.

with oval chasms of ebony, with seas of inky jet, and with summits of translucent pearl.

Clearer vision destroys, as always, ancient credulity. Faith grows weak in the doctrine that the moon is a treasury of lost articles, or that it is made of green cheese. Fewer, and ever fewer, folk believe in its single inhabitant or in his punishment for stealing cabbages, or for stealing vines, for refusing milk, or for churning butter, for mowing meadows, or for fencing fields on the Sabbath day.

It is for the magic wand of photography to dispel the mists of popular superstition by the help of her scientific godfather, her own darling and puissant agent and assessor, light. It is for the photographer, and for him alone, to give representations of this lesser luminary at once eminently picturesque and perfectly true. It is for him, and for him alone, to show to the curious observer Tycho with its *rilles* of thousands of miles of radiant silver, the ring plains of Copernic and Aristarchus, the crater of Messier, the walls of Catharina, the Prolific Sea, the Sea of Serenity, and the Sea of Rest. It is for him to display—in small, on carte, or cabinet—this faded remnant of a worn-out world; this type—if we may listen to the tale of our most learned astronomers—of our own earth's future, when all its busy turmoil, its hopes and fears, its loves and hates, its pleasures and its pains, shall be hushed into eternal silence, and all its warm life lie frozen and dead in dark, and mindless, and everlasting oblivion.

## THE MICA INDUSTRY.

With the extraordinary growth of the electrical industry in the United States for a number of years past, there has been created a new and steady demand for mica, which, curiously, has failed to stimulate the mica mining industry in this country; the most important mines, indeed, show a decided decrease in producing during this time, and the business is now in a depressed condition. In the construction of dynamos, electric motors, and some other electrical appliances, mica is a very important element, valued on account of its flexibility and excellent insulating qualities. For this purpose, however, there is a decided preference for foreign mica, the Canadian "amber mica" being generally used.

Mica is employed in dynamos and electric motors, mainly in building up the armatures, strips of various dimensions, but usually about one inch wide, and from four to eight inches long, being used.

The foreign mica is considered preferable to that of North Carolina for this purpose, in that while the latter can be split into thin sheets, it is by no means so tough, which is an important requisite. Such mica may, perhaps, be found in the United States, but up to the present time there is no doubt that some imported micas have proved more suitable for this purpose than the usual domestic grades.

Hitherto, the most important—in fact, almost the only important—use for mica has been in stoves, and the demands, and, consequently, prices of the article for this purpose have been such that mica mining was carried on at considerable profit.

The chief mines in the country are in New Hampshire and North Carolina, but principally in the latter state, these producing an excellent quality of the mineral. Several years ago changes were made in the patterns of stoves, whereby smaller and correspondingly less expensive sheets of mica were used, and the lower prices resulting depressed the industry greatly, especially in North Carolina, where many mines were closed. The total value of the product in the United States decreased from 368,525 dollars in 1884 to 70,000 dollars in 1890. During the same time the imports of mica, which, prior to 1884, had been of but trifling importance, increased from 28,284 dollars to 57,541 dollars.—*Engineering and Mining Journal.*

## COLLOTYPE PRINTING WITHOUT MACHINERY.

At a meeting held last Wednesday night in the rooms of the Photographic Society at 50, Great Russell Street, London, Mr. James Glaisher, F.R.S., presided, and Mr. Leon Warnerke gave a demonstration of a simple method of producing collotype prints, or, as he preferred to call them, "collograph" prints, according to the terminology adopted at the late International Photographic Conference at Paris. There was a crowded attendance.

The speaker stated that collography is fifteen or twenty years old, and that he had placed upon the walls of the room specimens of recent work executed by many home and foreign firms; he added that the exhibition would be open to the public for a month. He intended to show a simple method of getting equally good results, without the employment of costly machinery; in fact, the printing was done in a common screw copying-press.

Mr. Warnerke continued that the process which he was about to describe was based upon the use of vegetable parchment coated with gelatine, instead of employing a rigid glass or other support from which to print. He himself had no commercial interest in the process, but it might be a convenience to his hearers to know that it was devised and introduced commercially by M. Raymond, of Paris, and who now has agents in London.

The parchment paper is sold in rolls ready-coated with gelatine. A piece of the size required is cut off the roll, and floated for three minutes upon a three per cent. solution of bichromate of potash; the time of floating is of importance; when floated too long the film becomes too sensitive. The sensitising may be done by daylight, for the bichromates are insensitive while in solution, but the floated sheets must be dried in the dark; it is convenient to prepare them in the evening, and to allow them to dry in a dark place for use the next morning. A few drops of ammonia added to the sensitising bath will make it keep longer, perhaps for months. After the films are raised from the sensitising bath, they are squeegeed on to a plate of glass, the face of which has previously been rubbed with talc, better known under the name of "French chalk"; on this plate the film is allowed to dry in the dark, after which it can be peeled off, and with a face as smooth as that of the glass itself.

The sheet is next exposed under a negative in the printing frame, preferably to diffused daylight when the negative is of an average character and density. In direct sunlight, the proper time of exposure may perhaps be five minutes; an actinometer has to be used. When the details are out in the shadows, the exposure is finished. It is then desirable to expose the back of the sheet to diffused daylight for perhaps five minutes, to cement the print on the front to the back, and render the film better able to resist wear and tear; moreover, this supplementary exposure sometimes improves the picture. The print is then put into standing water for two hours, or into running water for a shorter time, to remove all the bichromate of potash. The print is next placed for one hour in a bath consisting of—

| | |
|---|---|
| Glycerine ... ... ... ... ... | 70 parts |
| Water ... ... ... ... ... | 30 ,, |
| Ammonia ... ... ... ... ... | 3 ,, |

This last bath is not absolutely necessary, but it makes the film last longer. The picture is now ready for printing.

The sheet next has to be placed in a special and simple frame, obtainable in the market, and of about the size of a common photographic printing frame for the same size of picture. The object of the use of the frame is to stretch the parchment upon a flat support, and to keep it smoothed and stretched during the subsequent manipulations. An elastic pressure obtained by means of felt is given in this frame.

The preparation of the ink to be employed is an important matter. An ink for collography is sold by the trade, but almost any stiff ink will do, including that used in letterpress work. Two inks have to be used in collograph work: the stiff ink attaches itself to the darker parts of the image; the soft ink is next applied, and brings out the half-tones. For diluting the stiff ink he used varnish, and for diluting the soft ink he used "suet"; he mixed his inks to suit each picture. The rapidity of the rolling of the sheet has an influence; if too much stiff ink have been applied, most of it can be removed again by the rapid motion of the roller. At this stage of the process the individuality and artistic taste of the operator can come in, and he has much more control over the results than in common photographic printing. Before the ink is applied to the wet sheet, the latter is covered with a piece of clean paper, and put in the copying press for a short time to adequately remove surface moisture. It is then taken out, the piece of paper removed, and the ink applied; for the stiff ink he preferred a leather roller, for the soft ink a gelatine roller. The ink attaches itself to the places at which the film has been acted upon by light, but not to parts unacted upon and consisting simply of damp paper.

Should the ink not come off the sheet when the first impression is taken, it is a sign that the film is too dry. Some of the glycerine bath should then be put upon it with a sponge, and dabbed over it with a clean rag: it must be dabbed, not rubbed, otherwise the film may be injured. Allow the film to rest for a few minutes, then re-ink.

The paper used must be sized, and the pressure which has to be applied by the press will be less the more the paper is sized. The paper is backed for printing by placing upon it two pads of felt and one of india-rubber. The earlier impressions are never so good as those which follow. To get clean, sharp margins, narrow slips of paper may be laid upon the edges of the sheet from which the printing is done. The working of any particular ink varies with the temperature, and ink which works well on a cold day may possibly not do so upon a hot one.

Mr. Warnerke stated that the applications of the process were numerous. The parchment sheet being flexible, it could be used to print upon wood blocks; printing upon canvas could be done by its aid, and prints produced with vitrifiable colours for photo-ceramic work.

The President had to retire early, after which Mr. John Spiller took the chair, and in the course of some remarks said that the Secretary had written to M. Lippmann to ask if he would favour the Society with some of his heliochromes to exhibit at its meeting next Tuesday.

DETECTION OF SODIUM THIOSULPHATE IN SODIUM BICARBONATE.—J. Lüttke (*Chemiker Zeitung*). If we add a few c.c. of a solution of barium nitrate to a solution of sodium bicarbonate previously saturated with hydrochloric acid, and not containing sulphuric acid, no turbidity or precipitate ought to be occasioned. If a thiosulphate is present, there is formed a turbidity or a precipitate on adding a drop of permanganate, which transforms the thiosulphate into a sulphate.

## A NEW HAND-CAMERA.

MESSRS. George Houghton & Sons have exhibited to us a new hand-camera, in which each plate, after exposure, is removed from the front to the back of the bundle of plates, without opening the camera or using a bag; this is done rapidly, and an opaque diaphragm always between the exposed and unexposed plates is useful as a guide when the operator is about to begin developing operations. The camera works automatically,

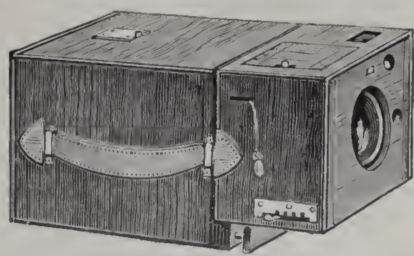


*Fig.* 1.

and is small in size; its general appearance is indicated in fig. 1. The one shown to us acted well, and seemed as if it would do good work in practice.

A, Fig. 2, is a catch releasing the front plate, and letting it fall

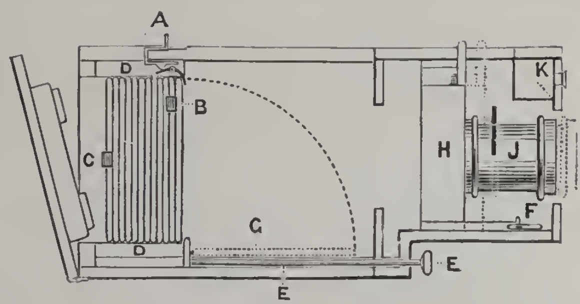



*Fig.* 2.

into the position G; B, springs preventing the second plate from falling; C, springs catching up the exposed plate after it has been brought to the back; D, movable reservoir holding twelve plates; E, brass rods with a wooden connecting bar, attached to the reservoir; F, lever acting on the shutter and lens for focussing: H, shutter; J, lens; K, view finder.

Fig. 3 represents the camera tilted for changing a plate.

D, reservoir drawn forward by the rods E after exposure; G, front plate after exposure, and having been released by the catch A; L, the position of the plate when the camera is first tilted, and the reservoir drawn forward; M, the position

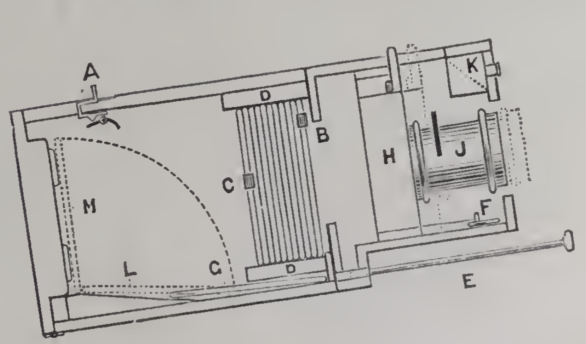



*Fig.* 3.

of the plate when camera is placed in a vertical position, and ready to be picked up by the reservoir when it is pushed home, which operation, at the same time, forces the next plate past the springs B, so that it is ready for next exposure.

Messrs. Houghton and Sons thus describe the working of the camera:—The plates are contained in a special form of sheath, and are placed one by one in the reservoir through the door at the back of the camera, the front one resting on the springs B, shown in fig. 2. After putting in the twelve plates place the wooden dummy sheath over them, and press it past the springs C ; then close the door, which is fastened with a lock and key. The use of the dummy sheath is to indicate when the twelve plates have all been exposed, as it is constructed so as not to pass catch A. When it is desired to remove any exposed plates before the whole have been used, open the back of the camera, and all those exposed will be found at the back of the dummy sheath ; the latter should then also be removed and the reservoir refilled, replacing the dummy sheet in its original position.

After exposure, in order to change a plate, press forward the catch A in fig. 2, at the same time inclining the front of the camera downwards to allow the plate to fall from B to G ; then draw forward the reservoir containing the remainder of the plates by means of handle E, and allow the exposed plate to slide back up the inclined plane from G to L by tilting the camera as shown in fig. 3, when, by raising the camera to a vertical position, the plate will fall against the back of the camera from L to M, and, by then pushing home the reservoir, the plate will be pushed into position at the rear of the other plates, and, at the same time, the front plate will move forward beyond the springs B, and be held by the catch A ready for the next exposure. It is important that the reservoir should be pushed well home until the handle E is held firm by the brass spring catch provided for that purpose.

## Patent Intelligence.

### Specifications Published.

2,628. *February 18th*, 1890.—"A Magnesium Flash-light." (A communication from Charles Lansiaux and Charles Merville, 42, Boulevard Boune Nouvelle, Paris, Photographic Apparatus Manufacturers.) Alfred Julius Boult, 323, High Holborn, London.

The subject of the present invention is a novel portable apparatus for the instantaneous production or generation of the magnesium light required for taking photographs in otherwise dark places. This extremely simple apparatus gives a light sufficiently powerful to permit of the taking of instantaneous photographs in the open air and during the worst weather.

The apparatus consists of a small box acting as a reservoir, and containing a bent tube which passes through the box, and is connected at one end with a collapsible ball by means of a caoutchouc or other flexible tube. This box, intended to be filled with magnesium powder, is closed by means of a screw or equivalent stopper. The bent tube within the box is cut away to admit the magnesium powder into its interior, and, in addition, has at its lower end a small conical tuyere covered by a single or double sheet of thin metal gauze. The upper end of the bent tube is slightly pointed or reduced in area for the purpose of converging or directing the particles of magnesium powder issuing from the box against the burning portion of a fuse or fusee. The fusee, the name of which indicates that it is a sort of match of which each portion remains a certain time in combustion after it has been lighted, is held in position by a socket soldered to the box and slightly inclined on one side.

The apparatus acts as follows : The reservoir box having been filled with magnesium powder through the removable stopper, a fusee is inserted into the socket or holder. When the moment has arrived for commencing an operation, friction is applied to the phosphorus-coated end of the fusee by the box in which it is contained, by which means it is lighted. The ball is then pressed so as to cause the air it contains to traverse the tuyere and the holes in the metal sheet, and to propel all the powder contained in the bent tube, and which had been admitted by the before-mentioned opening in such tube, against the fusee. The magnesium powder ignites instantly on coming in contact with the red portion of the fusee, and produces the magnesium flash-light. If it be desired to take a second proof, it is sufficient to place another fusee in position, and to light it and to press the ball for the purpose of expelling a fresh charge of powder. It is thus possible to go on producing flashes until the box no longer contains any powder.

The object of the before-mentioned metal gauze is to permit the air to pass into the bent tube when the ball is compressed, and to prevent, by the fineness of its holes or interstices, the magnesium powder from being sucked into the flexible connecting tube and collapsible ball when the pressure is removed from the latter, and when it re-inflates itself.

3,393. *March 4th*, 1890.—"A Sensitised Flexible Film." Edward William Foxlee, 22, Goldsmith Road, Acton, London, Photographic Expert.

This invention relates to the manufacture of improved flexible films, to be used as a substitute for the ordinary sensitised glass in taking photographic negatives or positives.

It is well known that thin sheets of celluloid, coated with a sensitive emulsion of gelatino-bromide of silver, have for some time been in use, so also have thinner films of the same material, for what are known as roller slides. In the manufacture of the former, sheets of commercial celluloid are simply coated with the emulsion. In the manufacture of the latter, the celluloid compound is spread upon a rigid surface and afterwards coated with the emulsion, and when this is dry the film is stripped off. By either method only sheets of limited size can be produced. As celluloid is a highly electrical substance, it has been found that friction upon its surface, as when stripping it from the rigid body, or by the rollers of the slide when in use, evolves electricity, the light from which is found to cause marking or fogging in the negatives. When the celluloid film is very thin and flexible, it has a tendency to curl owing to the expansion and contraction of the gelatine on being wetted or dried.

By my invention the film is made in continuous or long lengths or webs, and the celluloid is protected at the back with a coating of gelatine, which serves a double purpose, that of protecting the celluloid from friction, and, by its expanding and contracting in the different operations of developing, fixing, washing, and drying the negative, counteracts the tendency of the film to curl from the expansion and contraction of the gelatinous film on the other side.

To make my improved film, I take a heavily calendered paper in the roll or web, or a "surfaced" paper. I then coat it in any convenient manner with a material which is impervious to water, and which will not disturb the fibre or texture of the paper—such as a solution of india-rubber, for example. After the solvent has evaporated, I apply a solution of gelatine containing chrome or other alum sufficient to render the gelatine insoluble, or partially insoluble, when it is dry, combined or not with some soluble, non-actinic colouring matter. The proportion of gelatine to water may be about the same as that in the sensitive emulsion.

This coating I apply in the same manner as in making continuous or long lengths or webs of carbon tissue for photography, or in coating gelatino-bromide paper. The india-rubber solution can also be applied to the paper in the same way as the gelatine.

When the gelatinous coating is dry, I apply the celluloid or pyroxyline compound—preferably prepared with volatile solvents—either in a fluid or in a plastic condition, according to the film required. When the celluloid or pyroxyline compound is employed in the fluid state, it can be applied to the web in the same manner as the previous coatings above referred to. When such compound is used in the plastic state, it can be spread on the web in the same way as india-rubber and similar substances are spread. The celluloid or pyroxyline compound I employ is similar to what is known as xylonite, celluloid, &c., and is composed of nitro-cellulose and camphor dissolved in suitable solvents—the camphor being itself a solvent—of which there are many. Those I prefer to employ for the compound when the latter is used in the fluid condition, on account of their volatility, are such as methyl-alcohol (wood naphtha), methylated alcohol, ether, benzol, &c., or mixtures of two or more of the same. If the said compound is to be used in the plastic state, some of the other well-known and less volatile solvents are preferable. I would have it understood, however, that I do not confine myself to the use of any particular solvents or proportions, as they have to be varied to suit circumstances. A good proportion, however, for a fluid compound is from four to six parts of solvent to one of solid matter.

After the solvents have evaporated, the celluloid is coated in a darkened room with the sensitive gelatino-bromide of silver emulsion; when this is dry, the back of the paper is moistened with a solvent of the first coating, such as benzol in the case of india-rubber; the finished film is then separated from the paper support or backing; this may advantageously be effected by connecting the ends of the film and paper to two separate rollers, which, on simultaneous rotary motion being given to them, will act to separate the film from the paper and wind them up respectively thereon.

I would here remark that I am aware that a collodion film has been spread on paper whilst the latter has been attached to a sheet of glass, and such film has then been coated with sensitised emulsion, but in such case the paper has remained attached to the film, and was not separated therefrom until after the negative had been exposed, developed, and fixed. I am also aware that paper has been coated with soluble gelatine, which has then received the sensitive emulsion rendered insoluble with chrome alum, and that the back of the paper has been coated with insoluble gelatine to prevent the film curling. In this film the paper has formed part of it until after exposure, development, and fixing, when the film bearing the image is stripped off the paper, which latter carries with it the insoluble gelatine backing. In this case collodion or celluloid is not used. I am also aware that a photographic film has been prepared by first coating paper with insoluble gelatine, then with india-rubber containing grease or wax, then with collodion on which is put a layer of gelatine, and on the latter the sensitive emulsion. Sometimes the plain gelatine is omitted. When using the above film the paper is not removed until the picture is finished. It has also been proposed to produce photographic films by using a temporary support, such as waxed paper, which is first coated with soluble gelatine, then with algin, which is afterwards rendered insoluble, then with the sensitive emulsion, each coating being dried before the next is applied. In this case the paper backing may be detached from the film at any time by treatment with warm water; but no mention is made of the use of collodion or celluloid in the preparation of this film. Photographic films have also been prepared by spreading a collodion compound upon glass plates, on which, when dry, the sensitive emulsion is applied. I therefore lay no claim to the various methods of forming photographic films above referred to, nor do I claim any of the steps of the process herein described separately considered.

What I claim is: A transparent flexible film for photographic purposes composed of a nitro-cellulose compound, with a coating of insensitive gelatine on the one side, and a coating of sensitive gelatine emulsion on the other, made in continuous or long lengths or webs upon a temporary paper support, which is removed from the film before use of the latter, substantially as herein described.

5,436. *April 10th*, 1890.—"The Exhibition of Photographs." JOHN DEWE, now residing at the Hotel Métropole, Northumberland Avenue, London, Gentleman.

This invention is for an improved apparatus for the exhibition of photographs or other pictures, by exposing them to a strong light, and throwing on the back certain shades and colours, so as to enhance the perspective and scenic effects, as viewed from the front. It consists—

1. Of a frame adjustable (by hinges or other devices) to any required angle firmly fixed on a substantial stand, in the lower portion of which may be placed a drawer.

2. Of a removable shade which can be attached to the top of the frame, so as to exclude the light, and to give effect to the picture placed in the frame, as viewed from the front.

3. Of sliding panels on each side of the frame, and at the top of the frame, so that the opening can be adjusted to the size of the picture or photograph to be exhibited.

4. Of arms attached to each side of the frame, projecting backwards from the front, and furnished with notches, holes, or rings, for the purpose of holding wires on which can be suspended coloured media or shades; the arms being capable of elevation and depression, and adjustable to any angle that may be required.

5. Of a metal reflector or frame, on which reflecting surfaces can be placed, hinged on to the lower part of the back of the frame, and adjustable to any angle that may be required, by means of a cord or other mechanical device worked easily from the front of the frame.

6. Of a second metal reflector or frame, on which reflecting surfaces can be placed, hinged on to the end of the reflector above-described, furthest from the frame, and adjustable to any angle that may be required, by means of a cord or other mechanical device worked easily from the front of the frame.

7. The pictures or photographs to be exhibited should, as a general rule, be made transparent, although this is not in all cases required. They may also receive, in certain cases, a slight colouring at the back, either by paint, or by the attachment thereto of transparent paper, on which the colours could be painted or chromographed.

14,189. *September 9th*, 1890.—"Films for Use in Photography." VICTOR PLANCHON, Boulogne sur Mer, France, Chemical Engineer.

My invention relates to films for use in photography, and is designed to afford a support for such films, and thus render the same rigid, and keep them extended during the operations to which they are subjected.

According to this invention, I add to the film at any moment in its manufacture thin, rigid, and narrow frames, which form a body with the film when they are finished, and serve not only as supports, but also as extenders. These frames may be rectangular or circular, or they may be of elliptical or any other suitable form, whilst their size varies with the different sizes of apparatus employed in photography. The thickness of these frames can also be varied. They may be quite plane, rounded, slightly stamped at their edges, or partially hollowed or perforated; they may, if desired, be varnished or coated with any substance which is susceptible of augmenting its adhesion to the film, preventing their oxidation and their chemical action upon the substances which constitute the film, or obviating their alteration in photographic baths.

It will be understood that I do not limit myself to any form or size of the said frames, the mode of manufacture employed, the means of applying them to the films, or to the substance of which they are made, which may be of any metal or alloy, or any other rigid substance.

The above-described frames are employed in the course of the preparation of the films made by known processes. They are fixed by simple contact, pressure, or by means of an adhesive substance provided upon or between the layers which constitute the film. These layers are formed of gelatine, gun-cotton, albumen, glycerine, varnish, fatty substances, or other translucid or transparent substances, modified or not by physical or chemical agents which are sensitive or insensitive to light, these substances being employed alone or mixed with each other.

The application of the frames is effected prior to the evaporation or oxidation of the liquid or syrupy agents employed, such as water, alcohols, ethers, oils, benzine, and any other volatile or siccative liquids, in such a manner that the substances hereinbefore referred to are applied in a humid, swollen, or pitchy state to the sides of the frames, and will cause their intimate adhesion. The frames may be fixed by one of their surfaces, or put between any two successive layers.

In practice, the operation may be carried out in the following manner, which, however, I describe only by way of example, as I do not limit myself to the same: Upon any even surface which has been provided with talc, collodion, wax, silicate, or the like, the substances constituting the film are spread by mechanical or other means; then either before the total evaporation of the solvents, or when the said substances are still in a humid, swollen, pitchy, or molten condition, the frames are applied and fixed in the manner above described. After their complete desiccation the frames will retain the film and keep it rigid and smooth. The films thus directly extended are of very small weight and volume; they can undergo the necessary operations, such as exposure, developing, and fixing, without any more inconvenience for the operator than if glass or prepared plates were used.

What I claim is:—The application to photographic films of rigid frames forming one therewith, the said frames being designed to afford supports for the films, and thus render the same rigid and keep them extended during the operations to which they are subjected.

## Correspondence.

### THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Sir,—Will you kindly allow the committee of the above Association to thank, through the medium of your pages, those ladies and gentlemen who so kindly gave their services, vocal and instrumental, at the very successful entertainment on Tuesday, March 3rd. With reference to the demonstrations on "Colour Polarisation" and the "Lantern Microscope" which were alluded to in an announcement during the evening, they will be given on Thursday evenings during April by Messrs. Debenham, Haddon, Briginshaw, and Freshwater. All interested are invited to attend.

The Hon. Sec. L. & P. P. A.

*The Champion Hotel, Aldersgate Street, London, March 4th.*

The London and Provincial Photographic Association.—March 12th, lantern night; March 19th, demonstration on "Gelatino-Chloride Paper," by Mr. J. Howson; March 26th, "High Speed Shutters," by Mr. A. S. Newman.

A Photographic Entertainment.—Last Tuesday night the London and Provincial Photographic Association had a convivial meeting at which about 250 persons were present, and in which songs, recitations, and music were intermixed with popular scientific experiments. Mr. Debenham mixed red and green lights to show that by physiological illusion they would produce a yellow, indistinguishable by the eye from the true yellow of the spectrum. Mr. Briginshaw's demonstration of certain phenomena of polarised light was warmly received, and Mr. Freshwater and Mr. Wellington lent much apparatus for the production of various optical results exhibited. Among those who took part in the entertainment were Miss Jessie Drage, Miss Rosa Lake, Messrs. E. W. Parfitt, F. A. Bridge, P. Everett, A. Cowan, C. H. Cooke, J. S. Teape, F. P. Cembrano, jun., J. D. O'Connor, Russell Ward, H. M. Hastings, S. T. Chang, A. S. Newman, and H. D. Atkinson.

A Photographic Exhibition in New York.—The Fourth Annual Exhibition of the Photographic Society of Philadelphia, the Boston Camera Club, and the Society of Amateur Photographers of New York, open to all photographers—American and foreign—will be held under the auspices of The Society of Amateur Photographers of New York, at the Fifth Avenue Art Galleries, New York, U.S.A., May 25th to June 6th, 1891. The agreement heretofore existing between the New York, Philadelphia, and Boston Societies, to hold annual exhibitions under joint rules and a joint management, was cancelled in October, 1890, and a new agreement adopted whereby exhibitions are to be held in rotation annually in the respective cities, but under the exclusive management of the local society, and under such regulations and rules as it may adopt. Medals or diplomas will be issued in the name of the society holding the exhibition. The board of directors of the Society of Amateur Photographers in October, 1890, appointed a special committee of arrangements, to select judges, and manage the exhibition to be held in New York, May 25th to June 6th, 1891, inclusive.

## Proceedings of Societies.

### London and Provincial Photographic Association.

*February 26th.*—Mr. W. H. Harrison in the chair. Presentations to the library were made by Mr. G. P. Harris. A circular was read from the president of the Toynbee Camera Club, inviting a representative of the Association to attend the forthcoming meeting to be held at the rooms of the Photographic Society of Great Britain. A resolution was passed appointing the Hon. Secretary as a representative of the Association.

Mr. A. Cowan showed results with several developers when used with bromide paper—eikonogen and hydrokinone, singly and in varying proportions, in combination with carbonate of lithium. The best results were obtained with the following developer:—

| | |
|---|---|
| Eikonogen ... ... ... ... | 4 grains |
| Sulphite ... ... ... ... ... | 16 ,, |
| Carb. lithium ... ... ... ... | 2 ,, |

to the ounce. The times of development varied from three to ninety minutes.

Mr. A. Haddon exhibited two sealed tubes, one containing eikonogen, water, and air; the other eikonogen dissolved in boiling water and allowed to cool before sealing. Both tubes were subjected to the temperature of boiling water. The contents of the first-named tube turned black in five minutes. The treatment in the case of the second tube was continued for three hours without in any way changing the colour of the solution.

### The Bath Photographic Society.

*February 25th.*—Annual meeting, Mr. W. Pumphrey in the chair. The Rev. C. Reay Pughe was elected a member.

The Secretary read the report, in which the committee congratulated the members on the success that has continued to attend the operations of the Society. During the winter months of the year, the meetings of the members have been well and regularly maintained, and many communications of great interest have been made. During the summer months various excursions were arranged and carried out. A list of the places visited, and also of the papers communicated to the Society at its various meetings, was submitted, which have been duly chronicled in these columns from time to time. The report continued: "Since our last report, the arrangements with the Royal Literary and Scientific Institution, which were then in progress, have been completed, and we have now, in addition to the dark room in the basement of the building, a convenient room for a library, and for meetings of committees, while our ordinary meetings are held in the large lecture room of the Institution. Some addition has been made to the library of the Society, and now that we have a suitable place, we should be glad to receive any contribution of books that may serve to illustrate either the history or the practice of the photographic art. Well-arranged photographs of Bath and its surroundings—a good series of the points of geological interest in the district—incidents in the progress of our city, which would serve as mementoes in the time to come, would be of great value, and ultimately make our library a credit to the city." The present number of members is eighty-one; in the course of the year there have been seven resignations and twenty-one elections.

The Treasurer's statement showed that the Society is in a sound financial position.

The Chairman, in moving the adoption of the report, said that it was a very satisfactory one. The Photographic Convention, he said, intended visiting Bath in July, when he hoped a very cordial welcome would be extended to the members of that body.

The motion was seconded by Mr. Braham, and accepted.

The election of officers then took place, with the result that all who served last year were re-elected.

The Chairman announced the forthcoming Exhibition at the Crystal Palace, and spoke upon the good work of the Benevolent Association, prospectuses of which were on the table.

Apparatus and views were submitted by several members, after which Mr. WELLS discoursed on the subject of "Lantern Slide Making." The speaker, in opening, said that, before entering on the main subject of lantern transparencies, it might be as well to briefly glance at the history of the optical—or more generally designated magic—lantern. That its origin dates far back was obvious, for Kircher, in the fifteenth century, described a lantern of which the fundamental principles were similar to those of the present instrument. Until the middle of the present century, the optical lantern was used as an amusing toy for children, but with the development of science it became so much improved, that people of mature growth delighted in witnessing the exhibition of its pictures. The transparencies first used were of the crudest kind, being mere daubs in transparent oil colours of comic subjects, but, as the lantern became more popular, the public exacted better work in the pictures shown, and artists of repute began the painting of slides which were really works of art; but even in these there was a coarseness in the detail that compelled the slides to be of large size—some which were shown on the screen being 6 by 6 inches—to attain anything like sharpness. Until the introduction of the limelight by Lieut. Drummond, oil had been the only illuminant, and enlargements of small diameter only could be shown; but with the new light a fresh power was in the hands of the operator, and the piercing rays of the incandescent lime showed up the defects of the hand-painted slides. It was then that the introduction of the wet collodion process by Archer worked a revolution, and photography stepped in to the aid of the lanternist. By its aid reduced positives on glass were made from large negatives which were full of detail and rendered the most charming enlargements, everything being sharp and clean. The size was then reduced, and large condensers used, the standard size of slide now being $3\frac{1}{4}$ by $3\frac{1}{4}$. (A wet plate slide was then projected on the screen.) The lecturer next dealt with the various processes for slide-making, mentioning Barnard's litho transparencies, the Woodburytype, the Aristotype, gelatine chloride, silver citrate, and the gelatine bromide. He said that the introduction of dry plates had worked a reformation in the lantern, for now tourists can carry a small camera with them on their travels, and reproduce on the screen the beauties of spots visited, to the entertainment and instruction of their friends. Mr. Wells then practically demonstrated the making of a slide by contact, the same being made and developed and shown on the screen—pyro-ammonia developer and Thomas's plates were used. Reduction was next treated, and after explaining the kind of negative most suitable, the lecturer made a reduction by magnesium light. Exposure was then treated, and examples shown of over and under-exposed, and over and under-developed, plates. Varieties of colour by exposure, and modifications of development, were explained and shown on the screen. A few plates made recently by Mr Wells concluded the demonstration. During the delivery Mr. Pumphrey vacated the chair to manipulate the oxy-hydrogen lantern.

Mr. BRAHAM, who filled his post, moved a vote of thanks to the lecturer.

### THE RICHMOND AMATEUR PHOTOGRAPHIC SOCIETY.

AT the meeting on Friday, the 27th ult., Mr. C. H. DAVIS in the chair, the accounts of the recent lecture by Major J. Fortuné Nott were submitted, showing a balance of £4 available for the Richmond Hospital.

Failing a promised demonstration, there was no special subject on the programme, but an interesting discussion took place, turning chiefly upon devices in the development and mounting of lantern slides.

### THE SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE proceedings at the meeting held at the Masonic Hall, Surrey Street, on March 3rd, with Mr. B. J. TAYLOR in the chair, included the election of new members; the exhibition of prize medal lantern slides of views in Switzerland, Italy, Scotland, Yorkshire, and other places; and selections of vocal and instrumental music.

### THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE annual meeting of this Association was held on Friday last, the PRESIDENT in the chair.

The report of the Committee, recently published in these pages, was read and unanimously adopted.

The following officers were elected for the ensuing year:—*President*—Mr. J. Traill Taylor; *Trustees*—Captain W. de W. Abney and Mr. W. S. Bird; *Committee*—Messrs. W. Bedford (chairman), W. Benham, R. P. Drage, F. H. Berry, T. E. Freshwater, G. T. Harris, A. Mackie, J. S. Rolph, H. D. Atkinson, J. D. O'Connor, Parfitt, and Hudley; *Honorary Solicitor*—Mr. W. Benham, 4, Great James Street, Bedford Row, W.C.; *Treasurer*—Mr. John Spiller, F.I.C, F.C.S.; *Honorary Secretary*—Mr. H. J. Beasley, 65 and 66, Chancery Lane, W.C.

### THE BRECHIN PHOTOGRAPHIC ASSOCIATION.

*March 3rd.*—Mr. G. MACKIE in the chair.

Mr. J. C. MIDDLETON gave an address on lantern slide and transparency colouring, and strongly recommended the members to finish their slides with colour.

Mr. Ross, in moving a vote of thanks, said that he was not greatly impressed with the ordinary commercial coloured slides, and thought that good plain slides were better than most of the coloured slides in oil.

Bailie LAWRENCE then exhibited some slides of American and South African views.

### THE GREAT YARMOUTH AND EASTERN COUNTIES PHOTOGRAPHIC SOCIETY.

AT the meeting held on the 3rd inst., one of the principal features, after the election of several new members, was the adoption of a circulating portfolio amongst its members. Each member would be entitled to send not more than two unmounted prints, irrespective of size up to 15 × 12, with full particulars of the work to be written on slips to be provided by the Club. The portfolio to be sent to the members in the rotation in which their names appear on a sheet attached thereto. Each member to be responsible for sending it on to the next, after retaining it for not more than two days. A criticism sheet would also be attached for members to write their criticisms upon.

The President (Mr. ARNOTT) offered a silver medal for the member who should obtain the best criticism during the year, and Mr. HARVEY GEORGE (the secretary) promised a second silver medal for the second best contributor.

Mr. JOHN HOWSON then gave a description of various photographic papers and plates, and gave a demonstration of the methods of manipulating the same. A number of lantern slides to illustrate the results of the various processes was passed through the lantern.

It was decided, upon the proposition of Mr. RUMBOLD, that the first outing of the Society should take place at Easter.

### THE WEST LONDON PHOTOGRAPHIC SOCIETY.

A MEETING was held at the Broadway Lecture Hall, Hammersmith, on February 27th, Mr. W. A. BROWN in the chair.

The SECRETARY read a letter from Mr. Biden requesting the Society to send a deputation to a meeting he had convened to consider a scheme for federating the various societies, and other matters. It was decided that the President, the Hon. Secretary, and Mr. Hodges be requested to attend the meeting, but not to pledge the Society in any way.

It was decided that the Society enter for the Crystal Palace challenge cup, and that the members be requested to send pictures to be selected from by a committee of the council.

### THE BIRMINGHAM PHOTOGRAPHIC SOCIETY.

*February 26th.*—At a meeting held in the Midland Institute, Mr. ALEX. TUCKER, C.E., occupied the chair.

Mr. G. A. THOMASON said, in reply to a question, that he had made enquiries, and found the art of ceramic enamel was extinct in the United Kingdom, and that they were made in France principally.

Mr. H. M. SMITH (Eastman Co.) said that Mr. A. L. Henderson, of London, had made them for years, and no doubt he could give some information on the subject.

It was asked whether it were cheaper to buy bottles of compressed oxygen and hydrogen, or to make oxygen and use the usual coal gas, and bags, and pressure boards?

Mr. W. J. HARRISON said that, at present, although the bottles are handy, they are costly, and there is the difficulty and also delay in getting them filled. The Midlands will, however, soon have a factory at Saltby, where compressed gases can be obtained; till then, he should advise members to defer having bottles of gas, and to use the bags.

Mr. A. J. LEESON gave a paper on "Photographic Shutters." He said that the object of the paper was to bring before the members some of the different shutters at present in the market, with explanations of their mode of working, and, in some of the fastest, giving the speed as tested by himself and Mr. Jerome Harrisou, at the invitation of Mr. Underwood, who has brought out a shutter-testing chronograph, which was worked with an "Otto" gas engine. The shutter registering the highest speed was Marion's (Bain's patent) "Crown" shutter, which gave a speed of $\frac{1}{150}$ second; the "Caldwell" shutter gave $\frac{1}{100}$ second; Underwood's plate shutter gave $\frac{1}{100}$ second; "Kershaw" ($3\frac{1}{10}$ inch aperture) gave $\frac{1}{75}$ second; Underwood's "Instantolux" gave $\frac{1}{60}$ second; Shew's Eclipse gave $\frac{1}{60}$; Thornton Pickard gave $\frac{1}{60}$ second; "Voigtlander's Sector" gave $\frac{1}{35}$ second; Thornton Pickard (double blind $2\frac{1}{2}$ inch aperture), gave $\frac{1}{38}$ second; Sands and Hunter's gave $\frac{1}{38}$ second. Other shutters were exhibited, made by Messrs. Wratten and Wainwright, Wray, Marion and Co., Thornton Pickard (including the "Fan-break" with their stereoscopic), Shew and Co., Tylar, Place, Underwood, &c., and also the "Guerry flap," Wollaston's diaphragmatic, the new Kodak, &c.

Mr. W. J. HARRISON then gave a short paper on "Instantaneous Photography." He said that Goddard first made instantaneous photography possible in 1841, by his discovery of the extreme sensitiveness to light of silver bromide. Five things were necessary to secure an instantaneous picture viz., a good light, suitable shutter, lens, plate, and camera. The time of the year when instantaneous photography could best be practised was from March to September, and the time of day from about ten o'clock to three o'clock. Speaking of shutters, he said most of his successes had been achieved by means of the "Grimstone."

THE LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

*February 26th.*—Mr. PAUL LANGE, president, occupied the chair. The following were elected members of the Association:—Messrs. Robert W. Hill, James H. Wood, T. F. Lloyd, Thos. Cook, Wm. Cook, J. Bardsley, Mr. Marriott, and Jos. Robinson; Mr. Sinclair was elected an honorary member.

Mr. CADE (Messrs. Marion and Co's representative) exhibited and explained their new hand camera, "The Radial." The evening concluded with a paper and demonstration on "Eikonogen *v.* Pyro," by Dr. Jumeaux, of the Manchester Amateur Photographic Society.

THE PHOTOGRAPHIC SOCIETY.—Mr. William England exhibited a portable tent in which to develop or change dry plates.

THE DARKNESS OF LONDON AIR.—Mr. George White writes to *Nature*:—"Londoners need not be surprised to find black fogs when it is a fact that tons of soot float in the atmosphere every day. Hoping to get some fact on the subject, I collected a patch of snow, equal to one square link, that had lain from November 27th to December 27th last, and from which I obtained two grains of soot. Now, supposing London to cover 110 square miles, it would produce 1,000 tons of soot. Imagine a month's allowance being drawn off in a line by 1,000 horses! The line would extend to about four miles in length."

RECEIVED.—From Mr. E. R. Fletcher, of Edinburgh, samples of an "improved combined mask binder"; they are useful, and save some trouble in binding lantern slides; if the Irishism may be allowed, they are something like metal binders stamped out in paper.

# Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the PHOTOGRAPHIC NEWS, Messrs. Piper & Carter, 5, Furnival Street, London.

The PHOTOGRAPHIC NEWS is the oldest weekly photographic newspaper. See its consecutive number to-day on the front page.

G. G. M. (Edinbro').—*The Pioneers of Photography.* Enquire of Mr. John Werge, 11a, Berners Street, W., who has a capital series of the pioneers of photography, and Robert Hunt's portrait is among them.

J. A. O. (Aldershot).—*Eikonogen Cartridges.* These can be obtained of Messrs. Marion and Co., Soho Square, W.

C. J. K. (Tunbridge).—*Salicylic Acid Preservative.* We should not anticipate any tendency to crystallise out from a gelatine mountant, nor any trouble to arise from its employment in the manner contemplated. Oil of cloves is another antiseptic equally available, and if dissolved previously in a little alcohol, could be stirred in so as to get an intimate mixture. It is only necessary to use a small proportion in either case to protect the gelatine from mildew.

F. ANKER.—*Sulphate of Quinine as a Non-Actinic Medium.* From experiments made and published many years ago, it was proved that quinine only cuts off some of the higher refrangible rays, and therefore could not be used as an efficient substitute for ruby glass. Mr. Crookes took some excellent photographs of variously coloured flowers behind a quinine screen. See the papers of Sir John Herschel, Mr. Robert Hunt, and Mr. Crookes, in the first volume of the *Photographic Journal*; also Sir George Stokes's earlier paper in *Philosophical Transactions of the Royal Society* for 1852; and J. Spiller on "Quinine as a Non-Actinic Medium," in the *Journal of the Photographic Society*, October, 1869. The last was a reply to Professor Morren's communication in the *Comptes Rendus*, in which it was asserted that a cell of quinine solution *could* be used as a substitute for yellow glass in photographic laboratories.

J. C. D.—*Standard Developers.* If you compare the details given by the Altenbourg photographer with Dr. Eder's proportions, as stated in the YEAR-BOOK, 1890, page 54, you will find them to be almost exactly the same, or as quoted in our "Standard Formulæ," top of page 228; so it is immaterial which you use. Do not dilute the developer, but use it as it is, and employ enough to cover the plate well at one sweep. We shall be glad to see your specimens of Australian photo mechanical work.

G. J. S.—*The Dry Weather.* February has beaten the record, and so small an amount of rain as ·02, or even ·01 inch, for the London district is altogether unprecedented, the average being 1·55 inch. The variations occurring during the past four years at Canonbury stand thus:—February, 1888, ·80 inch; 1889, 2·19 inches; 1890, 1·03 inch; and 1891, only ·02 inch; so that there is a wide divergence between the past month and the corresponding period of two years ago, when a hundred times as much rain fell. Damp fogs were prevalent, so that the absence of rain did not bring the best of photographic weather.

G. C. & B.—We note your remark about foreign exchanges the difference in value can yet be arranged between yourselves and our correspondent.

W. S. (Camberwell).—*Reversed Negatives and Dry Collodion Plates.* 1. It may be that you have Colonel Waterhouse's recent discovery in mind, but it is not easy to take a negative from a negative by the wet process, nor a transparency directly in the camera. 2. Would Mr. R. Manners Gordon's gum-gallic process answer for your dry collodion plate which is not to contain any albumen or gelatine?

M. P.—*Feer's Diazo Process.* The chemicals could be obtained from Messrs. Green, Cross, & Bevan, 4, New Court, Lincoln's Inn.

H. W. and F. D. T. received; also W. S. B., Boston, Mass.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1697.—*March* 13, 1891.



CONTENTS.



## THE NEW DISCOVERIES IN HELIOCHROMY.

Some additional particulars in relation to Professor Lippmann's researches will be found in other parts of this issue, but a stage seems to have been reached at which experienced practical photographers can give substantial help. For instance, M. Lippmann has been making extensive use of pyrogallol as a developer, yet this substance is well known to favour the production of yellow and brown images, which are likely to deteriorate the quality of his results. Ferrous oxalate tends to throw down a coarse crystalline image, therefore, under ordinary conditions, may not be the best for his purpose; whilst eikonogen, with its black and white images, and its extremely minute rendering of fine detail, seems to be exactly the substance required, according to M. Lippmann's working hypothesis, which hypothesis is one which commends itself to experienced physicists and mathematicians, and has been long since foreshadowed by two or three of them. His hypothesis requires that a number of faintly perceptible layers shall be superimposed, to give the final result by accumulation.

The organic reactions of collodion are less forcible than those of gelatine and albumen, and not alone does this point to collodion as a suitable vehicle, but it has been asserted that M. Lippmann's most brilliant results have, so far, actually been obtained with collodion. Collodion films in this process will probably need longer and more careful development than others, with, perhaps, a considerable proportion of alcohol in the developers.

Assuming a slight trace of surface fog to exist in M. Lippmann's photographs, momentary treatment with an excessively weak solution of Farmer's reducer might brighten them up. At present the images are developed by the discoverer from the front; were the developers applied from the back the character of the resulting images might be modified for the better or the worse. This points to taking, developing, fixing, and washing them upon plates of polished silver, afterwards applying a layer of alumed gelatine, and then stripping the film, which is easily done.

For present experimental purposes, M. Lippmann's plan of using a mercurial reflecting surface seems to be the simplest and the cheapest. Mr. Warnerke complained at the Photographic Society that he could not get commercial mercury pure enough for the purpose. Such mercury can be purified to a considerable extent by shaking it up in a bottle for a prolonged time with broken iron shavings; certain oxides and other impurities attach themselves to the iron during this scouring operation, and are carried off by the solid metal. Mercury can be to some extent cleansed from oxidised matter floating on its surface, by twisting a sheet of paper into a cone, and leaving a pinhole at the point of the cone, then pouring the mercury through; the latter will come out clean and bright, to an extent depending somewhat on the nature of the physical surface of the particular sample of paper, to which surface oxidised matters will more or less attach themselves, and let the bright metal run through. We have been informed that common copy-book paper, rubbed over with soft chalk, such as is used for drawing on a blackboard, is an excellent thing for cleansing mercury, when the paper is twisted into a cone as already described.

## PHOTOGRAPHIC LIMITATIONS.

Now that spring is approaching, most good photographers will be looking up their apparatus, and looking forward to the happy time when opportunity will enable them to wander with their cameras into pleasant places. The minds of both professionals and amateurs will tend to this direction, and although the latter now outnumber the former, the earnest worker for profit finds his holiday to be no holiday at all unless he carries with him a camera of some kind. Spring brings with it, besides the opening of bud and flower, the opening of many a picture gallery, and the photographer takes a keen pleasure in visiting these, so that he may take hints from art as well as from nature. Indeed, so much is now written about the connection between art and photography that a camera worker is apt to take a great interest in what his brothers of the brush and palette are doing.

True it is that much overstrained language has been devoted to the connecting link between the work of the artist and that of the photographer, and anyone ignorant both of painting and photography, after reading some of these highflown compositions, would be apt to think that the owner of the camera has his subjects as much under control as he has who guides the brush. But experienced photographers know well enough that there is a very definite limit to their power. They may make careful study of a landscape, or any piece of still life, and, by choosing point of view, and the best light under which to work, they can arrive at a good result. Some, too—but they are very few—can, by careful grouping, produce a good picture of the *genre* kind. The difficulties of such work have been explained by its best exponent, Mr. H. P. Robinson, and there is no need to dilate upon them here. But to less gifted photographers these difficulties seem to be insuperable, and one of the greatest bars to success is the impossibility of that idealisation which constitutes the power of an artist. The camera worker must, to a great extent, take things as they are, while the artist with pencil can pick and choose, can select such things as he requires, and eliminate others. As a case in point, we may instance a certain photograph, taken by a most capable man, of a busy London street. It is without exception the finest street photograph which we have ever seen, full of that light, half-tone, and general sparkle which one values so much. But artistically it is spoilt by three figures in the foreground, each with the right leg outstretched in the act of walking. The photographer could not have anticipated such an accident, and it would be idle to blame him, but a painter would either have eliminated one or two of the figures, or would have changed their attitudes.

Another difficulty which assails the photographer, and which, as far as we know, has not been commented upon, is suggested by another photograph—a group of cattle—which now lies before us. As that group was originally seen by the worker, it appeared to be a favourable subject for his camera, for some of the animals were standing, some lying down, and the whole was nature itself. But the photograph is far from satisfactory, and chiefly for the reason that the animals look too flat, too much as if they had been cut out of card, and laid against one another. The head of one sticks palpably to the hind-quarters of another, while there is a feeling that the whole would have been much better if each had been shifted to another position. Why did not the photographer foresee the effect which would be produced on his plate? If he had been a one-eyed man he would probably have done so, but the ability of seeing the subject with two eyes conferred upon it the quality of distance, and so separated each creature from its fellow. In the photograph this effect is lost, and the picture is flat and unsatisfactory. Now an artist—such as our veteran cattle painter, Cooper—would have had the power of selecting from that group the animals he wanted, and would simply have left the others out of his composition. In a word, he would have idealised that group.

Such difficulties as these need not dishearten the photographer, but he will do well to recognise them, and to acknowledge frankly their existence. By carefully studying the works of artists who are not bound to produce all that they see before them, he will learn what to aim at. If nature has denied him the power to impart life to his works by the judicious use of figures, let him devote himself to pure landscape. It is the fashion just now to decry such works as representing a lower rung of the photographic ladder, but, in our opinion, a photographic landscape of good quality is a very delightful thing to look upon.

## HELIOCHROMY.

BY GABRIEL LIPPMANN, OF THE INSTITUTE, PROFESSOR OF THE FACULTY OF SCIENCES, PARIS.

My plates have been fixed in hyposulphite of soda; the use of the word "hypophosphite" was a lapse. Some plates, such as those with albumen films, have to be rapidly taken out of the fixing solution, but most plates stand it very well.

Most finished plates have to be looked at by reflected light from the free side of the film. On the other side you see nothing but a copper-coloured image. Lately, however, when working with Taupenot plates, I have noticed that when viewed by reflection through the glass, you see a bright coloured negative image—the red, for instance, appearing as green.

I am sorry that I have so few plates complete yet, and those in such great demand here that I have been unable to send any away. When able to comply with your request for one, I shall do so with pleasure.

The Croydon Microscopical and Natural History Club (Photographic Section).—On Friday, March 6th, Mr. H. S. Fry demonstrated and gave an explanation on "The Uses of Bromide Paper," illustrated by a fine series of examples, both contact and enlargements; some good examples of warm tones, obtained by toning with uranium, were also exhibited, illustrating that bromide prints are not confined to the usual cold grey, when brown tones are required.

Mr. H. S. Mendelssohn.—An evening paper says that Mr. H. S. Mendelssohn, the well-known photographer, arrived in England some twenty years ago as a political refugee. He actually took part in the last rising of the Poles, and when the corps to which he belonged dispersed, only got here after a series of quite marvellous escapes from being taken and shot. He first dodged into Warsaw, where some friends hid him until the vigour of the search after him had subsided. Then one night he had to follow a strange guide through strange fields and lanes until he came upon a waggon, in which he was driven to his next hiding—seemingly a hay-loft—where he stayed some weeks. In the same mysterious way he was moved from town to town until Hamburg was reached. Mr. Mendelssohn has been unable to this day to discover who his friends were. Once in England, his natural talent as an artist was turned to account in the photographic studio of Messrs. Downey. They both saw and remunerated his great abilities, and though he afterwards entered business on his own account, even now the senior member of the firm of Downey is Mr. M.'s close friend. Mr. Mendelssohn has photographed the royal family, and it is safe to say that not a single famous beauty, artist, sporting, or literary man or woman has escaped being operated on by him. Though Mr. Mendelssohn is too much engrossed by his art to take an active part in politics, his early experience of Russian injustice has fixed his sympathies on the side of all who are poor or oppressed. He is naturalised, and resents in a half serious way being called a foreigner.

## PROFESSOR LIPPMANN'S DISCOVERIES IN HELIOCHROMY.

Y FREDERICK H. VARLEY, MEMBER OF THE INSTITUTE OF ELECTRICAL ENGINEERS.

'he renewed interest taken in the subject of photographing 1 natural colours is due to the highly philosophical and ıgenious way in which Professor Lippmann has devised a ıeans for the solution of this problem, means so apparntly clear and simple that one cannot fail to foresee that, t no very remote period, their application and employnent will be so far developed as to render it a practical rocess entitled to enter into the domain of every-day hotography. And why not?

The requisite conditions are:—First, a film highly ensitive to all the colours of the spectrum: secondly, the lm to be as transparent as possible, in order that the ıcident and the reflected light shall be of nearly equal ıtensity, and for the bettter formation of the superposed eflecting layers, each a half-a-wave-length thick, in the ody of the film; thirdly, a perfect reflecting surface in ptical contact with the film; and when the conditions ave been fulfilled, and the plate exposed, fourthly, then omes the question of a suitable developer, which will loubtless prove to be one which reduces the silver in right reflecting deposits. These conditions are not eyond the prospect of reasonable attainment.

From M. Lippmann's paper, read before the Academy f Sciences, Paris, on February 2nd, one can gather all he main features of his discovery, and we learn why it is o essential that the sensitised film should be, at the time f exposure, in optical contact with a perfect reflector. 'or convenience, mercury is used by the inventor, but here is no reason why a surface of polished silver—a much etter reflector than mercury—might not be employed dvantageously.

The function of the reflecting surface is to turn the 'aves of light back upon themselves, and to cause intererence with the incident waves, by which a series of zones r planes of luminous activity is set up at half wave-length intervals in the body of the film; it is in these zones or planes that the latent image is formed, the number and thickness corresponding to the half wave-lengths of the colour producing them. These zones or planes are, of necessity, formed at the half wave-length, because, if the reflected wave be one length behind the incident wave, total absorption of undulatory energy occurs, whilst at the half

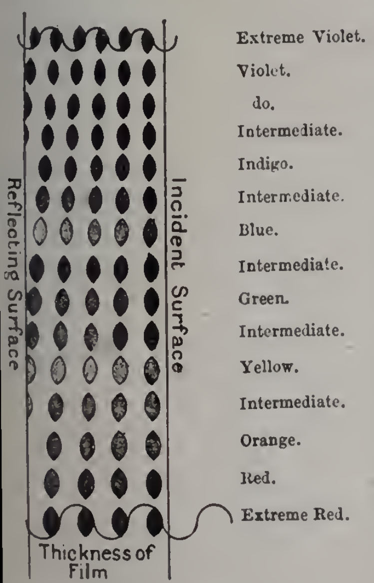



*Fig.* 1.

vave-length it adds its energy to the incident wave. t is here, then, that we expect to find the silver reduced by light. M. Lippmann considers that, in photographing the spectrum, the layers of silver are continuous, and not divided into gratings. I believe that we shall find, when we have the means of examining the deposits, they are not only arranged as a series of horizontal plates one above another, but that they are really divided into separate zones forming vertical gratings.

Fig. 1 is a diagram of layers and gratings made up of half wave-length interference zones, corresponding with the photo-molecular reaction deposits set up in the sensitive film, and is constructed to represent wave-lengths for the entire visible spectrum, and which, I believe, somewhat approaches the correct form of the several maximum deposits, as if seen at right-angles to the direction of the light-waves.

Fig. 2 shows the zone of light energy formed by the interference of the two waves. In the continuous spectrum the dotted line represents the reflected ray; the continuous line the incident ray; the dark nucleus the area of maximum silver deposit; the grey portion, fringes. The zones overlap and form a secondary series of interferences tending to scatter and not compress the molecules constituting the deposit. Thus, zones are produced in the direction of the wave constituting the nucleus of the deposit, and forming, by superposition, columns of gratings in the film, the so-called layers only being formed by lateral displacement at right-angles to the direction of compression.

Silver Deposit

*Fig.* 2.

Where these zones overlap, as in fig. 3, forming a continuous layer at the points of secondary interference, the deposit would be scattered, and thus the layer would be formed of a series of hills and valleys, the valleys being more transparent in consequence of the scattering of the deposit, whilst the hills would be proportionately opaque by their greater density, arising from concentration within the zone of luminous activity.

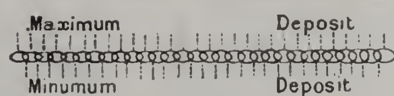



*Fig.* 3.

The photograph of the continuous spectrum in its true colours is a case not only of superposed thin layers in the body of the film, but is also due to vertical gratings.

All credit is due to Prof. Lippmann for furnishing a new physical proof of the correctness of the undulatory theory of light, by which he has obtained silver deposits which correspond to the figures Faraday produced from sonorous vibrations, by employing lycopodium powder to show the zones of maximum disturbance in the air.

In conclusion, I may add that M. Lippmann, in reply to a communication of mine, dated March 2nd last, says, ". . . . I am of your opinion that the thicker the film, the brighter the colour, up, perhaps, to a certain maximum, but I consider each separate layer of silver to be continuous, and not forming by itself a grating."

This letter was in response to the arguments I set forward in favour of the grating theory, and also in regard to the brilliancy of the colour increasing with the number of superposed reflecting surfaces. I hope soon to have the experimental proof one way or the other.

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

Photography in Colours—Vitrifiable Photo-Collographic Prints—Photo-Collographic Blocks on Zinc—Orthochromatic Plates Sensitive to Red—Ilford Lantern Plates—Exposure Shutters—Double Action Finders—Collodion Emulsion Prints—A Kite Camera—Forgery of Bank Notes.

*Photography in Colours.*—The sensation which was made on the occasion of M. Lippmann's discovery has hardly quieted down. It may be said that the thing has travelled all over the world; it has been everywhere talked of, and often in the most fantastic manner. As we have already said, it is, for the present, a question of pure science, and it cannot yet be known whether, on the facts brought forward, any application may arise, either artistic or industrial. What appears to be probable is that the results obtained by Messrs. Becquerel, Nièpce de St. Victor, and Poitevin were only due to phenomena identical with that of which M. Lippmann has just furnished such an interesting demonstration. It remains to be seen what can be done with composite colours, and no one can as yet predict anything in this respect. This question of colour is very ardent just now. There are in Paris three distinct concerns based on processes or methods having for their object, not the reproduction of colours, but photography with colours. The public, which is not yet sufficiently initiated into a knowledge of this kind, always sees beyond what exists, and immediately believes that the thing has come to pass. We hear a door-keeper relating how his own son, a schoolboy, has had his portrait taken, and that the buttons on his tunic have shown in copper, whilst his watch-chain has come out in real gold. We were informed only yesterday that an inventor had discovered a means of printing in three colours on the same plate at one impression. We saw a result said to be thus obtained which puzzled us. It was evidently a collographic print. According to the statement made to us, the inventor passes three rollers over the same plate, which is endowed with different chemical affinities—those places which have to be blue will only take the blue ink, &c. This explanation did not satisfy me. Nevertheless, the print examined was curious, and it certainly exhibits a new method, and one apart. If I succeed in finding out anything more about it, I will return to the subject.

*Vitrifiable Photo-Collographic Prints.*—The French Photographic Society had a very interesting meeting on the 6th of March, under the presidency of General Sebert, in the absence of M. Janssen. The beautiful specimens of photographic enamels presented by M. Raymond, the author of the process of collography on parchment of which M. Warnerke has spoken, were particularly remarked. By the aid of his photo-collographic process, he prints proofs in fatty ink in which he has incorporated ceramic colours. The printing is made upon paper covered with a coating soluble in water, such as gum, tapioca, or other analogous substance. The image is afterwards attached by an adhesive varnish to porcelain or pottery. The paper is removed by immersion in water, and, finally, the picture is fired. The process is destined to render great service to ceramic photography. By the aid of inks of various colours we may also produce polychromatic vitrified images. Up to the present, attempts in this direction have only given very feeble images after firing. Those of M. Raymond, on the other hand, present remarkable vigour.

*Photo-Collographic Blocks on Zinc.*—Without leaving photo-collography, which is now taking a more important place than ever, we come to the collographic blocks of M. Balagny. These are pellicles of gelatino-bromide of silver cemented to sheets of zinc, which may be fastened by nails to blocks of wood, as is done with galvanotypes. Up to the present, M. Balagny has not used these blocks for printing simultaneously with an imprint, but this can be done, and I shall certainly succeed in making use of photography in this direction, as I pointed out myself at the meeting of the 6th of June, 1879. We are convinced that, by reproducing on gelatine grained or network negatives, so as to obtain places absolutely black and absolutely white, very good results may be obtained, printing simultaneously the collographic image and type. It is, however, necessary to cut the block to the size of the design, without having to leave a certain margin all round, and the blocks of M. Balagny will render important service in this direction.

*Orthochromatic Plates Sensitive to Red.*—Messrs. Lumière and Son, of Lyons, whose manufacture of sensitive plates is so well appreciated, have just placed on the market orthochromatic plates of two kinds, one sensitive to yellow and green, and the other sensitive to yellow and red. The fact was brought to the notice of the Society by myself, accompanied by some explanatory details, and by lantern slides. The result of the trials is that I can recommend the orthochromatic plates of Lumière as being excellent. Those sensitive to yellow are of about the same sensitiveness as their ordinary plates, and as good as those of other makers who produce good ones. I only call particular attention to the red-sensitive plates. This kind was wanting; commercial orthochromatic plates, generally speaking, only exalt the sensitiveness to yellow; the red, on the other hand, coming out no better than with ordinary plates. With these sensitive-to-red plates used with a yellow screen, I succeeded in obtaining, even with the most intense red, the true effect of normal vision. If an orange-red screen is used, we suppress the action of the blues, even the light blues, and we may push the effect of red to the extent of rendering it white in our positives. The example which we forward to the editor of the Photographic News will give a convincing proof of this statement. It results from the initiative taken by the house of Lumière that orthochromatism will not be long in taking its place in the current practice of photographers in France, professional and amateur. Farther, it alone is capable of attaining the highest results, since it is the only means for rendering the entire gamut in reproductions of many-coloured subjects.

*Exposure Shutters.*—New shutters do not fail to appear. This time it is one by M. Chavanon, very simple, and working both for time and instantaneous exposures. Then there is one by Messrs. Hanssen and Co. for binocular work. It is a copy of an American model marvellously adapted for binocular use; it gives instantaneous exposures that may be repeated without touching the apparatus.

*Ilford Lantern Plates.*—M. Moltani showed some lantern slides on Ilford plates giving black tones. These slides shown on the screen were much admired. There were some beautiful landscapes by M. Moltani, and an interesting series of Dahomian women, photographed by M. Bucquet in the Jardin d'Acclimatisation, in Paris.

*Double Action Finders.*—Several double action finders ere shown. They allow of the image being seen either the horizontal or vertical plane, as may be required.

*Collodion Emulsion Prints.*—M. Chardon showed some arming prints on paper coated with collodion emulsion. his preparation is evidently superior to gelatino-chloride silver; it gives images of a solid character, and the rability of the prints is probably greater.

*Photographs taken by a Kite Camera.*—Photographs taken the aid of a kite camera were presented to the Society M. Wanz. We have here, evidently, a means of taking otographs from a great height without having recourse a balloon—a costly, complicated, and, consequently, fficult thing.

*Forgery of Bank Notes.*—This does not come from the rench Photographic Society, but from a quarter whence derives great importance, and has made much sensation. . Schlumberger, a chemist in Paris, has published in the *oniteur Industriel* observations relative to the possibility photographing—and, consequently, forging—bank notes. *csimiles* have been shown in support of his statements. . Schlumberger, at the same time, points out how such rgery may be rendered difficult, and even impossible. e Bank of France, to whom the chemist made certain opositions, has not accepted them; it has, indeed, been question whether M. Schlumberger is to be prosecuted account of the publicity given to his directions. The mber of the *Moniteur Industriel* has been seized. The atter is one of great interest from a photographic point view.

## INTENSIFICATION.*

BY CHARLES L. MITCHELL, M.D.

presenting to the Society this evening these few notes intensification, it is not my intention to offer anything w, but merely to call attention to some of the most portant details of an old and well-known process, mely, that with mercury and sodium sulphite.

The following method, many of the details of which re elaborated by Mr. John Bartlett, a member of this ciety, can be depended upon to give satisfactory results every case:—The negative (film or glass) should, after ation, be thoroughly washed and then dried. The dry gative is then placed in a suitable dish, film side up, vered with clean water, the face swabbed over oroughly with a tuft of absorbent cotton to remove air bbles, allowed to soak for a few minutes, then the ter poured off, and sufficient of the following solutiou ured on to cover the plate—

| | |
|---|---|
| Citric acid ... ... ... ... ... | 60 grains |
| Perchloride iron (dry) ... ... ... | 60 ,, |
| Water ... ... ... ... ... ... | 1 pint |

is is kept in constaut agitation over the plate for about inute, then returned to its bottle, and the plate washed der running water for about five minutes. This solu- n can be used repeatedly for a long time before coming exhausted. Its use is twofold: it tends to nove any thin film of fog upon the surface of the nega- e, and also furnishes a groundwork for the subsequent posit of mercury. The plate is now bleached by being ced in the following solution:—

| | |
|---|---|
| Mercury bichloride... ... ... ... | ½ ounce |
| Common salt ... ... ... ... | ½ ,, |
| Water ... ... ... ... ... | 1 pint |

* Abridgment of a paper read before the Photographic Society of ladelphia.

The plate must be frequently rocked while in this solution, and allowed to remain in it until sufficiently bleached. This is regulated by the amount of intensification required. If considerable density is desired, it must be allowed to remain until quite white. This solutiou is then to be poured off, and can be either thrown away or used for several more plates; the best results are obtained, however, by using fresh solution for each negative. The plate is next covered with some of the following solution:

| | |
|---|---|
| Common salt ... ... ... ... | 2 ounces |
| Water ... ... ... ... ... | 2 pints |

This is allowed to remain on the plate for about a minute, then poured off and thrown away, and the plate well washed under the tap for about five minutes. The object of the salt is simply to dissolve out any mercuric chloride remaining in the film, and prevent the clear portions of the negative becoming clogged up with any reduced mercury in the next operation. The plate is now returned to the dish, and a sufficient quantity of the reducing solution poured on it to just cover it. This is made as follows:—

| | |
|---|---|
| Sodium sulphite (cryst.)... ... ... | 3 ounces |
| Acid sulphuric (conc.) 2 drs. or ½ oz., | by weight |
| Water ... ... ... ... ... | 1 pint |

The sulphite is dissolved in 12 ouuces of water, allowed to cool, and then the acid, previously mixed with 4 ounces of water, added. I should say just here to those not familiar with chemical manipulation, that in mixing sulphuric acid and water, the acid should always be poured gently and in small quantities into the water, not the water added to the acid, as in the latter case, owing to the violence and heat of the combination, some of the acid might be thrown in the face of the operator.

As soon as the reducing solution is poured on the plate it commences to turn brown and then black. The operation is completed when the *back* of the plate is perfectly dark, showing no traces anywhere of the whiteness caused by the mercury. The negative should then be perfectly bright and clear, and of a brilliant bluish-black colour. It is then to be placed under the tap, washed for five or ten minutes to free it from all traces of sulphite, swabbed off with a piece of cotton, and set up in a rack to drain and dry. The reducing solution can be used several times until it becomes exhausted, and is then thrown away. It should never be returned to the original stock bottle. This process can be depended upon to yield in every case good and satisfactory results, and the intensification produced is perfectly permanent in character. The main points to which attention must be directed in order to secure good results are these:—

1. All solutions used must be filtered, clear, and free from specks.

2. The negative must have been previously *well washed*, so as to *thoroughly remove all traces of hypo.*

3. The negative must be moistened before the solutions are poured on, so that they will act evenly and uniformly on the plate.

A negative can, if necessary, be intensified immediately after development, fixation, and washing, without being allowed to dry, but in this case the density obtained will not be so great as if the plate had been previously dried.

The partnership between Messrs. Fry and Hayman was dissolved on the 14th January last. Mr. Fry continues the business on his own account, and no change will be made in the style of the firm.

## THE HISTORY OF PHOTOGRAPHY.*

BY DR. J. M. EDER, DIRECTOR OF THE IMPERIAL PHOTOGRAPHIC INSTITUTE OF VIENNA.

The French investigator, Le Gray, comes off badly again in another place in Schiendl's "History" (p. 57). Le Gray put forward the view that the application of pyrogallic acid to photography was, owing to Regnault's discovery, a French discovery. Herr Schiendl thus refers to it (p. 57): "To this phrase I will observe, that although Professor Regnault is the discoverer of pyrogallic acid, nevertheless its application to the development of photographic pictures was first recommended by Professor Justus Liebig" (*Ann. Chem. Pharm.*, vol. 1, N.S. page 113).

In this proposition Herr Schiendl falls over two stumbling blocks. In the first place, one ought not to set down the discoverer Le Gray as a "phrase maker"† when one is not in the position to affirm that Liebig actually was the first to recommend the application of pyrogallic acid to the development of photographic pictures. *Regnault* made the discovery independently of *Liebig*, and they happened, as nearly as possible, simultaneously. Without doubt, however, Regnault first brought this developer into practical use. *Schiendl* owes to us the information that Liebig was before Regnault.

In another direction Herr Schiendl, in the part I have just criticised, falls over a hard stumbling block against historical truth, as I will point out. He asserts on pages 56 and 57 of his "History" that Regnault discovered, in 1850, *pyrogallic acid itself*—that is to say, the chemical compound, not its use as a developer, as would appear from the quotation given above. This statement is quite incorrect, for pyrogallic acid was already twenty years before prepared in a pure state by *Braconnot* and others, and recognised as a distinct chemical compound, for before then it had only been regarded as gallic acid purified by sublimation. Braconnot knew that pyrogallic acid reduced nitrate of silver more powerfully than gallic acid. All this can be found translated into German in *Schweigg. Journ.* of the year 1831, and the reader thereby be convinced of the inaccuracy of Schiendl's twice-recurring statements (pages 56 and 57 of his "History").

On page 93, the "historian" in question farther writes that *Hermann Halleur* published a photolithographic process with oxalate of iron in the year 1854. Herr Schiendl places this discovery between Paul Pretsch (1854) and Poitevin (1856), so that the year given, "1854," cannot be a misprint. The author makes the examination of the statement here indicated difficult by not quoting the source; nevertheless, one acquainted with the history of the subject is able to recognise that this arrangement of *dates* is incorrect. The book "Die Kunst der Photographie," by Halleur, wherein this process is described, had already appeared in 1853 (Simon, Leipzig). Herr Schiendl has thus incorrectly put the time of this discovery a year *late*, and *his date*, 1854, must be altered to 1853.

Not so simply to be dealt with is another statement. On page 169 of his "History" Herr Schiendl asserts that H. W. Vogel "published in May, 1884, his colour-sensitive collodion process, *on the foundation of Schultz-Sellack's observations, published in the year* 1871," and cites, in support of this statement, the "Berichte der Deutsche Chem. Gesellschaft" (1871) and "Poggendorf Ann." (1871).

* Concluded from page 180.

† *Phrase macher*, word spinner.

We now meet with the very astonishing fact that the sources on which Schiendl depends *in no way contain one word* that would justify his denial of the independence of Vogel's discoveries. When the sources are examined on which Schiendl in this case depends, everyone must admit that there is *not a word* to be found that takes from Vogel's notable discovery of colour-sensitive photography, or even touches it. H. W. Vogel studied colour-sensitiveness by the goal-reaching method of adding dye to bromide of silver; Schultz-Sellack used the old processes with iodo-bromide and iodo-chloride collodion, *without the slightest addition of a sensitising dye.* On this account the last-named process is quite inapplicable to the production of orthochromatic photographs, whilst Vogel's discovery worked a complete revolution in the photographic reproduction of coloured objects.

I bring forward this example in order farther to show in what an astonishing way Herr Schiendl treats weighty historical questions, and how the confiding reader may be led to suppose that the statements have historical basis, whilst a close examination makes it evident that the quotations of Schiendl are wrongly employed. The great service of *H. W. Vogel*, the discovery of orthochromatic photography, stands so high and unshakable that it cannot be disturbed by criticism of this kind.

The history of the most recent times is certainly difficult to write, that is for one who, on account of his photographic researches, has taken a decided part, and used sharp criticisms, so that further observations on this head may be dispensed with. I think that each word of Schiendl's which he writes concerning the deceased Dr. Monckhoven on page 303, applies in many cases to Schiendl's own work:—"*Moreover, these investigations do not show that impartiality which is indispensable in a scientific work; they seem much rather to be dictated by enmity.*"

It is not without interest to see how Herr Schiendl estimates his own photographic experiments in the historical development of photography. On page 66 *he places himself on the summit* of those experimentalists who sought to increase the keeping properties of wet collodion plates by the use of hygroscopic salts, and says *that he*, Schiendl, first made these researches *in the year* 1853, and that later *Spiller and Crookes* published the process.

Neither in the first case (Schiendl), nor in the latter case (Spiller and Crookes), is any original source of information supplied; the unversed reader will, therefore, if he trusts to the description in this history, give Schiendl the priority. The reader should remember that the author only recognises *priority of which there is evidence*, for he repeatedly asserts this principle. All this, however, is not observed when it is a question concerning himself. Schiendl has neither in the year 1853 nor in the thirty-seven years that have since elapsed, published anything on the matter, whilst *Spiller* and *Crookes* published their method in the *Journal of the Photographic Society of London* in the year 1854. There is not a trace of any confirmation of the statement that Herr Schiendl really employed the same or any similar process *before Spiller* and *Crookes*. It appears to me a very unjust thing, that on the ground of a statement without evidence, *Schiendl* should place *himself* before *Spiller* and *Crookes*, and seek thereby to lessen the credit of the latter for the priority of this certainly unimportant discovery.

The description of the history of the camera-obscura in the book before us is wrong, so far as concerns *Porta*. On this, however, I will no longer dwell, except to mention it as a warning to those who might be depending upon Schiendl's statements. The epoch-making discovery of objectives with great power of light by Petzval, in Vienna, he, with the exception of a mention in the preface, neglects in the most surprising manner; yet farther the name of this illustrious Austrian inventor, whom even the English without envy name the "Prince of mathematical opticians," is wanting in the register of inventors. Only in the frontispiece is the incorrectly spelled name *Petzwal* noticeable. That of Voigtlander is also wanting. The name, too, of *Carl Angerer*, who has done such important service, I have looked for in vain. His influence upon the modern photographic printing-press processes has extended far beyond local bounds, and he has done more towards the development of reproduction methods than many a dozen of the different photographers named by Schiendl.

Upon these omissions and other gaps in Schiendl's "History" I will not further dilate. The characteristics of the work are the decided and positive, yet incorrect quotations from important documents, wrong dates, and internal contradictions, of which I have given some examples. How many such exist in Schiendl's "History" I have not time and space to show. The critical examination of the foregoing faulty descriptions sufficiently show that Schiendl's "History" is no trustworthy and impartial guide. I will not farther weary myself with this dreary history, or take in hand the correction of other faults in Schiendl's book, which can lay no claim to the title of a serviceable "History of Photography."

The paper and printing of the book, however, are good.

*Vienna, February*, 1891.

## PICTORIAL COMPOSITION.*

BY P. H. NEWMAN.

Some one has said, somewhere, some time ago, that "there is nothing new under the sun." Someone was undoubtedly right, in the main, but he was not a photographer, or he would have had misgivings; misgivings, perhaps, not as to the newness of the art of photography, although the last Assyrian clay tablet has not been deciphered yet, nor the last of the Egyptian papyri unrolled, and although the old world goes on making revelations now-a-days in such a quite sensational and *fin de siècle* manner. No, his misgivings, had he been a photographer, I say—especially an amateur—would have been pretty general; he would have believed in most new things for a time, and certainly at least in the last, the very last, new thing, and as the advertisements advise, he would "see that he got it."

Yes, gentlemen, that insatiate and still unsatisfied craver for a new thing; that restless craver, who epitomises in one type the last quarter of the nineteenth century; that person possessed above all people by the demon of unrest, even in our time—the average amateur photographer—wants not only a brand new camera, and lenses which will do everything but think, with plates and developers to match, but he has wanted to make (and believed, at any rate for a time, that he could make) for himself new pictures by brand new rules, and in default of finding these ready to his hand has, now and then, had the temerity to formulate some for himself.

I open my address on pictorial composition this evening to you members of the London and Provincial Photographic Society with this preface because I wish it to be quite understood that I have nothing new to tell you; and if in your midst there should unhappily be one unfortunate possessed in any degree by this demon I have alluded to, as time does not serve for duly exorcising the unrestful spirit, I take the liberty in your interest, and his own behoof, of warning the unhappy being from the room. I have no message for him, and his presence will, while doing no good to himself, only disturb the placidity of those who believe with myself that photography, however new as an art it be, does not give its votaries new eyes, new brains, or new sentiments, but is ruled, like its elder brother and sister arts, by the same laws of pictorial composition we are content to think eternal, and more than suspect are divine.

Pray do not think me harsh in this serious admonition, nor personal in any quarter; bear with me, rather, and support me in my firmness, inasmuch as I know this disorder of unrestfulness is catching, and there is no knowing who amongst us may next take the insidious disease, nor to what lengths it may carry us; our ideas of pictorial composition might get inextricably mixed up with lengths of foci, a complication of the malady I have witnessed which is simply disastrous. I am not going to discuss foci at all—it is not my *métier*; there are gentlemen of eminence amongst you whose high qualifications are admitted and well known, who will tell you much better than I can what lenses will and will not do, and you may rely on their opinions. I will only caution you, however, in one particular, and that is, that some of them having, I suppose, a mild attack, an incipient unrestfulness, are not always quite decided what it is they want their lenses to do. Neither do I want to talk much about paper to-night, although, as I see a tendency lately to traverse and upset my dicta on printing surface, I must not let it pass altogether; my excuse must be, alas! that your art, gentlemen, can scarcely be accurately described as one of the arts of peace; for one of the features of photography is, as you know, that there is pretty generally a paper war going on. I will only say about paper, beware of the unrestful again. The desire to take the shine out of everything—that is no doubt part of our nature—is, under some circumstances, praiseworthy, and I do not at all mind the shine being taken out of paper, provided always you give me an adequate range of values in my shadows; but what I do object to is, that having succeeded in accomplishing a fairly pleasant pictorial composition, you should want me to mar the charm of that composition by making me look at it, so to speak, through a ridiculous reticulation; nothing will make me believe that roughness of surface is not a matter of absolute scale in works of pictorial art with the area of that surface; it were as reasonable to maintain that for a miniature painting, glass paper is preferable to ivory. Tastes undoubtedly differ. I can only regard those as curious which are satisfied only in a cabinet picture when it has the texture and grain of a fresco.

There are those who admire Constable. I am one of them, but I well know that his chief attraction does not lie in the roughness of his technique, a roughness which does not appear necessary when we look, as we do, with pleasure on the not despicable work of John Linnell or Turner. For my own part, while I have no sympathy, as I have shown, with this latest affectation, I look for no improvement in photography from the multiplication of landscapes where the sky appears equally ploughed with the fields; neither would a Venus born from the waves suggest a regeneration of art to my mind, or my sense of beauty and fitness be in any degree edified, however lovely she were in other respects, if that Venus were corrugated and pock-marked, and appeared rising from a pebbly sea. Craving your forgiveness, I say not another word on lenses or paper. Let us get to composition.

Now, I am quite prepared to be met at the outset by the outcry, "What stale nonsense! Whatever worn-out rubbish you may quote from Burnet or Harding, or derive from the old and delapidated masters, you can't take liberties with nature, and shift a group of poplars, a steeple, or a mountain, to suit your pedantic persuasions in photography, as you permit yourself to do in a sketch or water-colour drawing. Best let nature shift for itself," &c., &c. That we cannot do these things in photography that are the licences of the other pictorial arts, let us admit at once; so much the worse for photography, perhaps. But we have to make the best of photography, if possible, to-night, and the best of photography is this, that if you are really in earnest in search of the picturesque, the best photographer—*i.e.*, the man who is the best artist—will, other things being equal, give you the best picture. There is no

* A communication to the London and Provincial Photographic Association.

doubt about it, it is being proved every day. The worst and the best of photography, after all, lies in the man and not in the tools. Then what shall the photographer do? Is he to worship stocks and stones, taking the dross of nature for art, disbelieving that there is a subtle spirit anywhere, that she keeps back, except to the favoured few who know her face to face, and look her through and through, or to those seemingly almost as few who, with no divine afflatus, yet with simple faith and the intellect, such as they have, rubbed bright as God gave it them, will wrestle on any terms with nature for this treasure, and not too proud to profit by some of the counsel and experience of their race, wrest this spirit of art from the bosom of nature, delighting themselves and benefiting mankind?

"The man and not the tools," of course. For instance, look at Jones. "What in the world is Jones doing? He has been fidgetting about amongst those boulders for the last half hour at the risk of his neck and his sticks; he has only taken one shot this morning. I have taken a dozen. Why don't he fire away?" Listen to the hare and the tortoise. The hare's negatives are exuding hypo amongst the "spoilers" on a damp shelf now, but the tortoise has won a medal; for, not having either broken his neck or his sticks, he has, with infinite pains, found the very spot where the church tower comes in just right with the trees, so hence the straggling village creeps down to "the haven under the hill." Ah! and how he waited for the light, too! And it came, as everything comes to those who can wait, just in time to catch the fishing boat with the big white sail before she put to sea. Look how she comes out against the deep shadow, bringing the light down into that corner exactly where it is wanted. See, too, how the hill greyly softens off in the modified light of the lovely afternoon. "Yes, Jones has got a picture; I can't show it you, I regret to say. Why can't I get a picture? I am a better photographer, you know, than Jones," and so on. Well, let us see what Jones is made of, what manner of man he is, now we know what work he can do. And it turns out that Jones perhaps did not take lessons, even in a school of art; self-taught, and that sort of thing. But he was always fond of pictures, and it is said he can tell a Hobbema from a Cuyp when he sees them together, and he has said that he used, when a boy, to copy engravings, old steel-plate engravings—the kind of illustrations, you know, you don't find in books now, photography having improved them out of existence. Jones takes his sister to the Academy for their annual headache, and visits the National Gallery as a religious obligation twice a year. I am told he once borrowed Burnet, and actually possesses a copy of Harding. A curious fellow, Jones. Knowing something of Jones and a little of Harding, I thought I might do worse, perhaps, than bring some of Harding's ideas on pictorial composition this evening, that we might look over them together, for I think that many of the things he points out for the consideration of the painter may be made exceedingly useful to the photographer. Before, however, we try to assimilate and profit by any of Harding's teachings, let us see, as nearly as may be, where we are.

I think most of us will admit that, however simple may be the means of reproducing a scene by the camera, successful composition—in landscape especially—is unquestionably a far more difficult thing to accomplish in photography by an artist, than it is with the brush or the pencil. The most naturalistic photographer, though dangerously near it, has not gone quite so far as to say nature is art; and we are most of us pretty well agreed now that nature supplies the elements of art at our discretion, and in slightly modifying some of nature's arrangements in lanpscape, simple enough with the pencil, the photographer, if he has any art feeling at all, is often very hard pressed indeed to obtain an artistic result with the camera. It is all very well to say, "If the mountain won't come to Mahomet, Mahomet must come to the mountain," but, unfortunately, it is not always easy, but often most difficult for him to get to the mountain; and it is only by long study of composition in art, and considerable tact and practice in the field, that he is enabled to find the right spot to get a tolerable arrangement of nature's elements of beauty, even in very beautiful places. The scene looks so different in the natural vignette of our binocular vision to what it does when you cut a square or oblong out of the picture, and bind it by a hard and fast line with any lens of any angle.

But this is what the photograper has to do, and he stands all the better chance of doing it successfully if he is warned where he is likely to fail, and shown mistakes which the cleverest among us may fall into.

Let us turn now to J. D. Harding, who in his "Principles and Practice of Art," may do something for us with pen and pencil. Harding says:—"In the composition, the painter makes his first effort to convey the idea of the separation of the various objects, and to overcome those difficulties which have been pointed out as connected with the flat surface on which he paints. To effect this, none of the principal or leading features of his picture should be perpendicularly over, or horizontally level with, each other, because, if they be so placed, they either repeat actually or by suggestion the horizontal and perpendicular lines which artificially limit his picture, and which require to be concealed as much as possible from observation. The consequent advantages may be seen by comparing the Examples 1 and 3, 2 and 4, in Plate X. with each other. In Examples 1 and 3 the leading objects and features are so placed that they are neither level with nor over each other, and the expression of space is the result. Here, forgetting the surface and its boundaries, we feel able to penetrate into the pictures and move among the figures, trees, and buildings, to float in the sky, or walk along the ground. In Examples 2 and 4, however, no such feelings are suggested—at least, not by the composition. In Examples 2 and 4, a line drawn across the picture from C to D, and also from E to F, would show that several of the objects are on the same level, and, again, they are perpendicularly over each other. For instance, in Example 2, the church in the distance is over the man in the foreground, who thus appears to be supporting it on his head; the apex of the mountain is just above the spire of the church; and the castle on the hill is immediately over the bridge; each important feature of the distance surmounting another important feature of the foreground; all idea of space between the foreground and the background is, in consequence, negatived. As the artificial boundaries of the picture are thus emphasised and repeated, the flat surface is so continually suggested that the mind cannot free itself from it. If light and shade only were expressive of space, each of the four examples would express the idea of it equally. We, however, fail to obtain in Examples 2 and 4 the same idea of space as in Examples 1 and 3, although all have like advantages in other respects.

The most untutored eye may perceive that their effect is very different, though there has been no change in the features of the scenes, excepting such as was necessary to show the force of what I have brought before the student. Examples 1 and 3 are pleasing, varied, and spacious; 2 and 4 are bad because monotonous and flat; their comparative merits or defects are entirely owing to the composition.

We may take another illustration from Example 2 and 3, Plate XI. In Example 2, the castle is placed so as to come immediately over the basket which the woman carries; and, notwithstanding that the castle is faintly drawn, and small in size, in order to suggest the idea of distance, yet the contradiction given to it by faulty composition prevents it being entertained by the mind. The castle being immediately over the figure, is suggestive rather of the flat surface of a *picture* than of the permeable space of *reality;* but if we hide the castle, we then lose the impression of flatness, and, in its stead, receive the idea that we could walk round the figure. Compare this with Example 3, where the castle is removed to the right. Here we have the full expression of space, and, if we hide the castle, far from receiving in this instance, as in the other, any additional idea of space, we lose it greatly by so doing. It must be observed that the principle of placing the objects on different lines is not gained from a study or imitation of nature, but from an investigation of impressions made by art. Both the examples are equally true imitations of nature, as well in the objects themselves as in their juxtaposition.

(*To be continued.*)

## HELIOCHROMY—A PHOTOGRAPHICALLY DISCOVERED NEBULA.

BY DR. AUG. EISENLOHR, PROFESSOR AT THE UNIVERSITY OF HEIDELBERG.

As you printed in the last number of the Photographic News various interesting articles on photography in natural colours, I write to draw attention to a phenomenon I witnessed in the year 1857, and which I described in the article sent herewith.* Photography being at that time not much cultivated by amateurs in Germany, I learned from a travelling photographer how to make direct positive photographs on a dark glass—red or brown—with a collodion containing iodide of potassium with iodine and bromide, adding ten drops of bromine to an alcoholic solution of iodine. The photographs appeared of a white, silver colour.

When photographing a cousin of mine, who was a student, and wore a coloured ribbon with silver in it, I was much struck upon finding that the real colours appeared in developing, but that they vanished suddenly in the cyanide of potassium fixing bath.

I also send you a photograph of a new nebula in Orion discovered by photography by Dr. Max Wolf, Heidelberg, a friend of mine, astronomer at the University of Heidelberg. The nebula is only to be seen by means of photography, and not in the tubes. The photograph was taken by means of a double objective.

## PHOTOGRAPHIC TOURISTS IN ICELAND.†

BY J. REYNOLDS, M.D., F.R.G.S.

*Slide* 39.—Shortly afterwards we came to a magnificent gorge near Solheimar, on the Laxa River, represented in the slide. We arrived at Hruni 5.45 same day, and next morning (Sunday) at 9 a.m. we started for Gullfoss—four hours' easy ride—in lovely weather. We arrived at this splendid waterfall early in the afternoon, and photographed it.

*Slide* 40.—After examining the waterfall closely, we made straight for the Geyser, where we arrived 5.30 p.m. the same day, after fording a number of narrow, but deep and rapid rivers. Here we found our tents already pitched, and after supper we went out to explore this wonderful place. We saw the Great Geyser rise about forty feet, and the Strokkyr to full height; all the smaller springs—about thirty or forty in number—exhibit a general boil over.

*Slide* 41 shows basin of Great Geyser at rest at 11.15 p.m.

*Slides* 42 aud 43 show two views of Stokkyr in full action.

*Slide* 44 shows a remarkable underground boiling lake called "Blesi," with a portion of the roof broken in, revealing the caves and depths below. I am represented looking into it.

*Slide* 45 gives a general but poor view of geyser region with our tents in the distance.

*Slide* 45*a*.—The next morning, after completing our superficial survey of this extraordinary region, we started for Thingviller, a distance of close on fifty miles, resting on our way, of course, several times. The first place we came to of interest was the "Bruara," or bridge river, so called because a little bridge is thrown across an earthquake fissure in the centre of the river; a reference to slide 45 will show what I mean. We stayed here for luncheon, and, after crossing this bridge, we rode on as rapidly as the very rough road would permit us, arrived at Thingviller at 12 midnight, and then had to stroll about until 2 a.m. because our tents had been delayed in transit. However, we had a splendid supper at the parsonage of fried trout and other things, which made up for all other shortcomings. Thingviller is difficult to describe; it is actually a sunken plain, and the scenery around, the result of past volcanic action, is magnificent. Beside all this, it is a classic place, and has a history of its own. When, at last, our pack-ponies *did* arrive, we pitched our tent in the churchyard, and turned in for the night.

*Slide* 46 shows the parsonage and church in front of which our tent is pitched.

The next morning, July 15th, we took our cameras, and attacked the principal points of interest.

*Slide* 47 shows the spot in the Allmannaljia rift where the Oxara precipitates itself over the lava cliff, and takes a leap of about eighty feet; at the foot of this fall is Execution Pool, where the witches and murderers were drowned.

*Slide* 48 shows the rift itself, with the stream from the waterfall, just shown rippling through it. The scenery in this famous rift is superb, and the colouring exquisite.

*Slide* 49 shows the wild appearance of the extreme west end of the same rift, which consists of banks of lava, boulders, and clinkers.

*Slide* 50 shows the Lögberg, or Hill of Laws, where the old Althing, or parliament, used to meet hundreds of years ago. It consists of a tapering tongue of grass land, bounded on either side and at the end by immense fissures about fifteen to eighty feet in width, and about eighty feet deep. It is said that a murderer named Flosi, in order to escape capture, jumped over this part of the chasm, and hence it is called Flosi's Leap.

We had now come to the end of our very pleasant journeyings in Iceland, and we thought that before we parted company we would photograph ourselves in a group near the parsonage.

*Slide* 51, taken by me, shows such group.

One of our party went to have a day's fishing in the river Sog, and as he bagged thirty-five very fine trout in six hours, he was proud of the feat, and we photographed him presiding over the fish when we arrived back at Reykjavik.

*Slide* 52 shows these fish, which were exceedingly fine eating.

We started from this place July 16th, and arrived at the capital after five and a-half hours' sharp riding; then at once commenced to pack up our belongings in our own portmanteaus again, as we started on our homeward voyage on the 18th in the Danish s.s. *Romny*. We chose this steamer because she called at some of the ports in the Westmann Islands; also at some ports in the Faroe Isles, which we had a great wish to see. We could not, however, land, as there was not time; but we took some shots at the principal towns as we passed, and I managed, although the sea was rough, to get a good view of the Westmann Islands, the next three slides.

*Slides* 53, 54, and 55 will give a general idea of their appearance.

After leaving this group of islands, we went right through the Faroe Islands, and called at Westmannhaven, Klagsvik, Thorshaven, and Trangisvaag. Two of these ports I succeeded in getting a good view of while the vessel was moving, viz., Klagsvik and Thorshaven (the capital).

This completes the list of my views of places taken on this tour; but I have yet another slide. After we left Faroe until we sighted the Scotch coast we saw nothing but sky and water, and it occurred to someone on board to get up a ship concert, so eight or nine of us, including the Danish captain and chief officer, annexed various articles, such as a fog-horn for a trumpet, two tin saucepans for drums, a comb and piece of paper for a pan-pipe, a marling-spike [for a triangle, and a broken-down wheezy melodion, and with this collection we succeeded for some hours in breaking the monotony. While this was going on, I mounted the bridge and photographed them.

*Slide* 58.—Here they are. Now, my lecture being finished, I should like to tell you that I have here, in a case, a few specimens of lava from the crater of Heckla, also some siliceous deposit from the great Geyser; also a few articles of old Icelnadic work; and the *Reykjavik Journal* announcing our arrival.

In conclusion, I most heartily commend a trip to Iceland to those tourists who have the real enjoyment of travel, and who love to contemplate nature in her grandest and wildest aspects.

* The article alluded to is a reprint from Dr. Eder's *Jahrbuch* for 1888.

† Concluded from page 168.

## Notes.

Professor Meldola, in his lecture last Monday night at the Society of Arts, dealt with the problem of the training in this country of a class of photo-chemical specialists. A limited number of such men would be extremely useful in photography, in strengthening the machinery with which men of artistic taste have to work; moreover, such specialists could have certain technical branches of photography entirely under their own rule. No really thorough work is ever done in any branch of human knowledge without the aid of specialists, and the *dilettante* element in society often exercises an influence against such thoroughness. Still, men who are specialists, and nothing more, are not usually of an interesting nature. They know their own little grooves of existence thoroughly, but little or nothing outside them, yet frequently speak authoritatively on subjects outside their sphere, and with which they are not competent to deal. Two or three years ago scientific specialists received a little well-merited attention in pictures in *Punch*. Professor Perry once gave his engineering pupils some good advice, by telling them that when they went forth into the world, they had better, at night, when their work is done, study poetry, music, and other subjects for which they have a natural taste, and not confine themselves to one particular groove of thought. Professor Meldola does not confine himself to chemistry, but is well up in various other branches of knowledge, as the pages of *Nature* testify.

M. Bideaux recently stated at a meeting of the Photographic Section of the Society of Arts and Sciences of the Haute-Saône that he had been trying experiments in the sensitising of silk for positive printing, and had not found much difficulty in the work. A special silk is necessary, very fine in the filaments, hence it is costly. Vigorous negatives he had found to be best for printing upon silk, and they should be full of brilliant detail, otherwise foliage and grass will come out as unpleasant black patches.

Dr. Fischer, of Breslau, says Dr. Vogel, has succeeded in photographing, with their own light, luminous bacteria such as sometimes abound in stinking dead fish. Fischer also has cultivated luminous bacteria of different kinds; some were originally obtained from the North Sea, and when placed upon a cooked herring, the latter will become luminous in forty-eight hours, and can be used in the dark to reveal the time by a watch. Dr. Fischer began photographing luminous bacteria in a dark cellar three years ago; he used one of Steinheil's antiplanats, and gave exposures varying from thirty to forty-eight hours; the plates were exceedingly sensitive. He also succeeded in obtaining a passable picture of a watch which had been exposed for thirty-six hours in "the light of two luminous line-cultures"; the outside of the watch, the dial, with the hands and numbers, could be recognised. He exhibited some of these photographs at the Medical Congress in Berlin. In the days of old, the light of the glow-worm has occasionally been made to register itself upon a photographic plate. The light is rather strong considering its living source; Mr. Gerald Massey once told us that he wrote one of his poems by the light of a glow-worm crawling over the page.

It is the fashion in these days for everyone to write his biography, provided that his name has been at some time or other brought into prominence. In some cases, even an unenviable notoriety is considered sufficient excuse for running into print, as in the recent case of the "Jubilee Plunger." It is not often that any of these volumes are of interest to photographers; but one is about to be produced which is likely to prove an exception to the rule. This is the volume promised by the veteran photographer, Mr. Vernon Heath. Mr. Heath, during his long life, has had acquaintance with many eminent men, and those who know him well say that he is full of anecdotes about past times. It is not generally known that he is a nephew of the Robert Vernon who founded the Vernon collection of pictures, which may be regarded as the nucleus of the National Picture Gallery at South Kensington.

We have heard persons abuse the art of photography because of the many unflattering portraits which they say it turns out, and so it is a crumb of comfort to record an opinion to the contrary. Our contemporary, *Woman*, in a not too kind allusion to "Mr. Stanley's feminine rival," as it calls the lady who is about to enter darkest Africa as an explorer, speaks of her portrait in the following terms:—"The lady has been liberally interviewed, and flattering descriptions of her personality have been scattered broadcast by daily and weekly prints, sometimes accompanied by reproductions of a photograph, which does credit to the skill of Mr. Van der Weyde, and to the inventive powers of his camera."

But there is something more interesting to photographic readers anent this spiteful little notice regarding the lady explorer. It is illustrated by two little pictures—one a profile portrait, which certainly is not a very flattering one, whatever may be due to the inventive powers of the artist, and the other a full-length sketch of the lady equipped with rifle, dagger, and two revolvers ready for meeting any number of savages. These illustrations appear in the issue of the paper dated February 26th, and they are reproduced in the *Evening News* of February 28th. The copies are much coarser than the original, as might be expected in a journal which must be printed at high speed, but they are interesting examples of the tendency in modern newspapers to introduce sketches relating to matters of current interest. At the same time, this copying of such cuts from one paper by another is a practice which is hardly to be commended.

The Ceylon papers tell us that a number of instantaneous photographs was recently taken of a very curious pugilistic encounter, and it is to be hoped that some of the resulting pictures may reach this country. The encounter took place between a cobra and two mongooses (one feels inclined to write mongeese). At first the combatants were loth to begin the attack, but they soon warmed to their work, and then the fight began in earnest. The snake was a splendid specimen of the deadly cobra, but he turned out to be no match for his antagonists, for in the sequel one of them seized him by the back of the head and at once killed him. The photographs were taken while the fight was in progress, and show it at various stages.

It has been reserved for the New English Art Club to initiate a movement in connection with picture exhibitions which is almost certain to be at once popular and remunerative. The exhibition of the Club to be opened in April will be accompanied by a new feature, namely, the sale of photographs and reproductions of works in the gallery. The photographs must be supplied by the artist, who will thus have the satisfaction—or the reverse—of judging of the public's opinion of his work by the number of pictures sold.

The system of having photographs on sale might lead to greater facilities being offered for the reproduction of pictures. A good many studios are absolutely unfit for photographic operations, and the picture has to be removed to the photographic studio, there, probably, to remain for two or three days or more. It is not every artist who cares to trust a valuable painting to every photographer, and specialists in the difficult art of copying are not numerous. If there were attached to the Burlington House galleries a studio built and fitted up with a view to reproductions, which, of course, would be undertaken by skilled operators, the copying of paintings to be exhibited in the Royal Academy would become the rule, and not the exception.

In England, investigations in spectrum work are matters for private enterprise. In America there are funds from which assistance may be derived. Mr. Henry A. Rowland, in an article in *Science* (New York), gives a *resumé* of the progress in spectrum work during 1890, towards which financial assistance has been received from the Rumford Fund of the American Academy of Arts and Sciences, as well as from the fund given by Miss Bruce, of the Harvard Astronomical Observatory, for the promotion of research in astronomical physics; and the advanced state of the work is due to such assistance.

The spectrum work at Harvard may be summed up under the following heads:—1st. The spectra of all known elements, with the exception of a few gaseous ones, or those too rare to be yet obtained, have been photographed in connection with the solar spectrum, from the extreme ultra-violet down to the D line. 2nd. A measuring engine has been constructed with a screw to fit the above photographs, which, being taken with the concave grating, are all normal spectra, and to the same scale. 3rd. A table of standard wave-lengths of the impurities in the carbons, extending to wave-length 2,000, has been constructed to measure wave-lengths beyond the limits of the solar spectrum. 4th. Maps of the spectra of some of the elements have been drawn on a large scale. 5th. The greater part of the lines in the map of the solar spectrum have been identified, and the substance producing them noted.

Bicyclists are already a terror to nervous people, and if they follow the example of their American confrères they will be objects of hatred to local Boards and surveyors. In the United States the wheel-men are offering prizes for photographs showing the condition of the different roads, with a view of stimulating the authorities to do their duty.

There are wanted photographs of the common spectacle of the farmer's team and waggon hub-deep and knee-deep in the muddy road; photographs showing rough, rutty, and muddy roads in their worst condition; photographs showing the every-day break-down, caused by rough or muddy roads or steep grades; photographs showing smooth, hard-surfaced roads, and (if possible) teams hauling loads over the same; and other pictures illustrating the goodness of good roads, and the badness of bad roads. The prizes will be awarded before May 15th, 1891. A similar work performed as to the state of the London streets would do really good service.

A very exhaustive article on that almost inexhaustible subject, instantaneous shutters, appears in *La Nature*. The article is amply illustrated, and describes minutely the peculiarities of each recognised form. The author is M. H. Fourtier, whose concluding sentence sums up in a succinct form the *rationale* of instantaneous photographs. M. Fourtier says he does not desire to under-value instantaneous photography, for it has the advantage of giving to landscapes an animation which they would not otherwise possess, but he believes its function does not go beyond that. We should, therefore, not seek to record the exaggerated swiftness, which simply gives the silhouette of the movement while losing the details.

The apparatus recently constructed and invented by M. Damoizeau permits the photographing of the entire horizon in one short exposure. Until M. Damoizeau's invention there was but one apparatus, that of M. le Commandant Moessard, giving panoramic pictures; and this took in at most but half the horizon, and besides is based on another principle than that of the first-mentioned. Those who would like to thoroughly understand the method adopted by M. Damoizeau may study the elaborate article on the subject which appeared in the *Génie Civil* of February 21st.

## PHOTOGRAPHY IN LIVERPOOL.

THE LIVERPOOL INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

THE International Photographic Exhibition at Liverpool, initiated and carried out by the Liverpool Amateur Photographic Society, was inaugurated last Friday, and will remain open for a month. The Exhibition is a remarkably fine one, and the photographs are displayed in suites of rooms in the Walker Art Gallery, one of the finest public buildings in Liverpool, and situated in the centre of the city. The number of "frames" hung, as set forth in the catalogue, is 1,101, and this means a considerably larger number of individual pictures. A fair show of apparatus is also on view, chiefly the work of local manufacturers. The following are the officers and council for 1891 of the Society which has carried out this large undertaking:—

*President*—Mr. Paul Lange; *Vice-Presidents*—Messrs. Wm. Tomkinson and Joseph Earp; *Treasurer*—Mr. P. H. Phillips; *Council*—Messrs. R. Crowe, E. Roberts, A. Tyrer, J. Woolfall, A. J. Cleaver, W. P. Christian, W. Hughes, J. L. Mackrell, A. F. Stanistreet, Henry Luptou, F. B. Illingworth, aud B. Boothroyd; *Librarian*—Mr. A. Bradbury; *Auditor*—Mr. H. B. Millar; *Hon. House Secretary*—Mr. Thos. S. Mayne; *Hon. Secretary*—Mr. Edw. M. Tuustall, 3, Lord Street, Liverpool.

The following are the members of the Exhibition Committee:—

*Chairman*—Mr. Paul Lange; *Committee*—Messrs. A. J. Cleaver, C. O. Ellison, P. H. Phillips, and Wm. Tomkinson; *Hon. Treasurer*—Mr. A. F. Stauistreet; *Hon. Secretary*—Mr. T. S. Mayue, Fenwick Court, Liverpool.

The judges are Captain W. de W. Abney, Messrs. J. Gale, H. P. Robinson, Andrew Pringle, J. Pattison Gibson, and G. Watmough Webster.

The list of awards is here appended:—

THE LIST OF AWARDS.

| Class. | Medal. | |
|---|---|---|
| 1—Portraits | Silver | (*Withdrawn*) |
| 2—Portraits | Bronze | Harold Baker |
| 3—Portraits | ,, | Window and Grove |
| 4—Portraits | ,, | W. J. Byrne |
| 5—Landscape | ,, | E. Lloyd Edwards |
| 5—Landscape | ,, | F. D'Arces |
| 6—Landscape | Silver | Wm. Tomkinson |
| 7—No Award; Medal withheld | | |
| 8—Landscapes | Bronze | Thos Zacharias |
| 9—No Award; Medal withheld | | |
| 10—Marine and Cloud Studies | Silver | S. Bourne |
| 10—Marine and Cloud Studies | Bronze | Thos. Glazebrook |
| 11—Animals | Silver | Chas. Reid |
| 12—Groups (Outdoor) | ,, | F. M. Sutcliffe |
| 12—Groups (Outdoor) | Bronze | F. Bremner |
| 13—Architectural | ,, | C. Court Cole |
| 14—Architectural (8 × 5) | ,, | G. E. Thompson |
| 15—Scientific | Silver | R. Paulussen |
| 15—Scientific | Bronze | Cecil V. Shadbolt |
| 15—Flash-Light Pictures | Gold | Countess Loredano de Porto Boniu |
| 16—*Genre* | Silver | Shapoor N. Bhedwar |
| 17—Enlargement | Bronze | Chas. W. Huson |
| 18—Stereoscopic | Silver | H. J. Houghton |
| 19—Lanteru Slides | ,, | G. E. Thompson |
| 19—Lautern Slides | Bronze | John Carpenter |
| 19—Lantern Slides | ,, | F. Anyon |
| 20—Lantern Slides | ,, | W. L. Howie |
| 21—Lantern Slides | Silver | Priestley and Sons |
| 21—Lantern Slides | Bronze | J. W. Wade |
| 21—Lantern Slides | ,, | F. Anyon |
| 22—Hand-Camera Work | Silver | John White |
| 23—Hand-Camera Work | Brouze | A. G. Bristow |
| 23—Hand-Camera Work | ,, | J. M. Nicholson |
| 24—Hand-Camera Work | ,, | W. D. Welford |
| 25—Instantaneous | Silver | Karl Greger |
| 25A General Section | ,, | H. M'Michael |
| 25A General Section | ,, | W. J. Byrne |
| 25A General Section | ,, | A. Vandyke |
| 26—Ladies' Work | ,, | Miss Lil W. Tomkiuson |
| 26—Ladies' Work | Bronze | Mrs. Janie N. Hignett |
| 26—Ladies' Work | ,, | Mrs. S. Francis Clarke |
| 27—Beginners | ,, | Viucent Fothergill |
| —Champion | Gold | Shapoor N. Bhedwar |
| —Champion | ,, | J. B. B. Welliugtou |
| —General Collection | Silver | Chas. Scolik |
| —General Collection | ,, | R. S. Redfield |

Gold Medal—Ralph W. Robiuson, for his uuique collectiou of eminent artists (which forms so prominent a feature in the Exhibitiou), together with his other work.

On Friday evening last, a dinner to which the Liverpool Amateur Photographic Association invited a number of London and other guests connected with photography, took place at the Alexandra Hotel, under the chairmanship of the president of the Society, Mr. Paul Lange. He proposed the toast of the Queen and the royal family, and followed it with five of a highly practical nature, namely: 1. Everybody is allowed to smoke. 2. Those who wish for coffee, please order the same. 3. Ditto whisky. 4. Ditto kirschwasser or other liqueur. 5. Make yourselves at home. Next he proposed the health of the judges of the pictures, to whom, he said, the success of the Exhibition is largely due; he did not care whether anyone agreed with their decisions or not, but ruled that they were excellent decisions, for a chairman must be decisive, and is no good if he be not so; he therefore assured them that they had better judges than had ever acted at any other photographic exhibition. To this toast Mr. H. P. Robinson responded, and spoke highly of the Exhibition, so also did Mr. J. Gale and Mr. J. P. Gibson. As regards the quality of the photographs, Mr. Gale said that he did not know of any exhibition in which the average of merit had been so high as in that one at Liverpool.

The next toast from the chair was that of "The Presidents of Photographic Societies, and other guests present." Mr. Lange added that among the presidents at the dinner were some from London, Dublin, Manchester, Newcastle, Glasgow, and elsewhere. Without the societies photography would be in a barbaric state, and it would have been in the same state but for amateurs, who had done almost everything in the way of photographic invention and discoveries. To this Mr. Watmough Webster responded, and after a few more toasts, to which Mr. Henry Moore, R.A., Mr. Traill Taylor, Mr. C. W. Hastings, Mr. T. S. Mayne, and Mr. W. H. Harrison responded, the company adjourned to the Exhibition.

Here, at the opening meeting, Mr. C. H. Rathbone presided. Mr. E. R. Russell, in the name of the people of Liverpool, gave a warm welcome to those present, and spoke of how largely, of late years, the influence of photography has been making itself felt in connection with the daily lives of the multitude; also how it has progressed; it now presents features of artistic excellence which once might have been thought not to be possible. Photography, he said, is now the hobby of numbers of intellectual and artistic people.

*The Liverpool Daily Post* of last Saturday says of the exhibits:—

Naturally enough, in a collection of photographs the portrait is the first thought, aud in the catalogue of this International Exhibition the first four classes are given up to a collection of portraits, some of which (notably two sent by Mavius and Vivash) are marked by great softness—one having the appearance of a Bartalozzi. Two portrait pictures by W. Crooke deserve attention—one (No. 13) for the passage of light upon armour, and the other (No. 14) for the extreme delicacy of its treatment. An iuteresting quartet of figures of the *artistes* playing in "Ravenswood" is shown by Windsor and Grove; and Barraud and Co. have some fine portraits of operatic and theatrical *artistes* also hung. A new form of portraiture is exhibited by H. M'Michael, of Buffalo, U.S.A., who exhibits a number of portraits in character. There are two German figures, and also one the portrait of a man in "King Lear," which are charming studies—the latter beiug very free aud unforced. In another room Mr. M'Michael has a series of photographs graphically illustrative of the poem "Enoch Arden." Two charming pictures are those of W. J. Byrne, where a child is shown in the character of a "Water Nymph" (No. 95), and the same exhibitor also has some fine life-size portraits done in the orthodox form.

The most interesting feature of the Exhibition, however, is perhaps to be found in the small collection of "flash-light pictures." Time was when the photographer depended entirely upon the sun, but that time has now gone, and photographs moy be taken by means of artificial light. There are several fine examples of this process to be seen in the Exhibition, the most complete being, perhaps, the twelve pictures seut by Countess Loredana da Porto Bonin. In this instance, the artist—for, indeed, the photographs are capital *genre* pictures—has been most successful with her models. There is excellent humour in "The Village School" and "The Future Professor," the expression on the faces of the boys being very fine; and in "Training for the Choir" and "The Catechism," the artist has shown skill in dealing with the white tones in the drapery of the choristers. A series of four "flash-light" pictures of Professor Herkomer's "Philippo" (a poetic comedy played at Bushey), by F. Downer, show out very well; nor is Mr. Downer alone in this illustration, for several other exhibitors also send photographs of Professor Herkomer in this character. It may be sufficient to say that all these works show Professor Herkomer as impressive and dignified in the part. In this collection of "flash-light" pictures, attention ought to be drawn to the series of interiors by Johann von Campostellato Pasquali, some of which (such as the Alpine herdsman's hut) are very interesting. There is evidently a great future for this form of photography, and no doubt when the next exhibition is held there will be a larger collection of this particular form of the art.

The number of landscapes is very large, and in many instances striking effects in tone have been obtained. A series of very interestiug Icelandic scenes are showu by John Reynolds; and G. Bankart, in "A Crawling Burn" (No. 123), has a good effect of rushing water. The two photographs "Tall Poplar Trees" and "On the Exe" (Nos. 126 and 129), by E. Spencer, are skilfully taken; R. W. Robinson has a good work in "As the dreary, weak Suu goes Home" (No. 155) and J. G. Bullock, in his "Westward as far as the eye can reach" (No. 146), has shown that perspective can be attained in photography. Four very interesting studies of Spanish ports, which have all the fineness of line engravings, are shown by H. J. Menet (No. 166), and A. Hamilton has a quartet of Swiss scenes (No. 170), in which the snow is given with telling force. The series of pictures of Aysgarth by F. W. Stow (No. 198) is good, and a clever study of trees (No. 210) is shown by W. Bedford. There is very good tone in "The Hay Bridge" (No. 285), W. W. Naunton; there is a fine breadth in J. M. Brown's "Out with the Morning Tide" (No. 290), in which we have a view of Cowes from the sea, and E. P. Vulliamy, in "Three Cliff Bay" (No. 293), has a fine effect of distance. E. Lloyd Edwards has given a breezy feeling in "A Wild March Morning" (No. 385), and F. Anyon in the *genre* work, "Is Life Worth Living?" (No. 384), has succeeded in his humour. The cloud studies of T. Glazebrook (No. 407) are very fine; and in four marine studies (No. 419) H. R. Marsden has got a wonderful colour, the effect of moonlight being perfect. A series of studies of the Tyne are shown by L. Sawyer, all of which give a vivid idea of a busy mercantile place. Some clever photographs of animals are shown by F. M. Sutcliffe (No. 475) and by J. Catto (No. 491), the latter of whom shows great skill. An interesting Eastern scene is given by F. Bremner in an instantaneous photograph, and T. M. Brownrigg, in his Algerian photographs, has also done much to euable the visitor to understand the details of Oriental life. T. B. Sutton's grouping in "How Many Score's That?" is very fine, and a work which will attract a good deal of attention hangs near it, "Castle Street" (No. 706), which has that briskness and bustling feeling only to be produced by an instantaneous photograph. An interesting photograph is that by G. Plassy, "A Spider on its Web" (No. 684), which, taken by a flash-light, has been enlarged on Eastman's paper. The photographs of the works of Rossetti, Burne-Jones, and Watts, R.A., by F. Hollyer, are very fine, more particularly the "Happy Warrior" (No. 895), in which there is splendid light on the armour; and another work in which there is a clever treatment of light is "The Boat Builder" (No. 976), by L. Sawyer. There is good feeling in "Corbiere Rocks" (No. 1,006), A. R. Dresser, and "We Watch the Speckled Trout" (No. 1,019), J. P. Gibson, both of which are highly-finished works. The collection of portraits of artists at home, shown by R. W. Robinsou (No. 1,021), is most interesting; and a series of views iu Norway, by Paul Lange (No. 1,055), will well repay study, so highly artistic are they in their nature and execution.

The total number of exhibitors is two hundred and thirty; of these forty are foreigners. The chief prize, a gold medal, was awarded, as stated above, to the Countess Loredano de Porto Bonin, for some genre photographs, mostly of an amusing character, and in which the faces of the characters wore natural expressions. In the champion class one gold medal was carried off by Mr. Shapoor N. Bhedwar, and another by Mr. J. B. B. Wellington; the photograph exhibited by the latter is a landscape rendered in a somewhat "naturalistic" style. Another gold medal was awarded to Mr. R. W. Robinson, for his portraits of eminent artists.

As regards apparatus, Messrs. Sharp and Hitchmough exhibit an enlarging camera nine feet long, with cords running along the sides to adjust mechanism to place the negative in any desired position. Messrs. Archer and Sons have a show of optical lanterns, and Messrs. Taylor, Taylor, and Hobson of lenses. Mr. J. J. Atkinson, among other things, exhibits some "calcined flour," said to be good for rubbing down halation without scratching the film; he also exhibits a special piece of apparatus for testing shutters, with which he says that he is ready to test the speed of any shutter in the market; an optical method is employed. He has on view a complete set of lenses by Ross, and a new mechanical device for trimming prints.

Mr. W. Hume exhibits his cantilever enlarging apparatus, and Mr. Wood a reflecting stereoscope; the latter is an instrument rarely seen now-a-days, although it can be used for large pictures. Mr. Thomson exhibits a camera with a rather ingenious rising and falling front arrangement; and the proprietors of *The Daily Graphic* exhibit type-high photozinc blocks in various stages of preparation. The exposure meter of Mr. Watkins is on view, and Messrs. Wray and Son have a large show of lenses, several of them in aluminium mounts, which metal in mounts is a great blessing to photographic tourists. Messrs. Wood Bros. exhibit apparatus, so also do Messrs. Lewis and Co. Mr. A. Watt, F.I.C., exhibits a "dark developing bath," intended to avoid the necessity of using a dark room; and Mr. T. Miller exhibits a hand-camera of simple construction: he has a capital showman.

Various photographic visitors to Liverpool were hospitably entertained by the Liverpool Association at the Alexandra Hotel, a particularly comfortable establishment, ably managed. It is the headquarters of the Swiss Club at Liverpool, which club is the general place of social meeting for Swiss residing in and about the city. Its president, Mr. R. Engler, of St. Gall, says that at Neuchâtel the various amateur and other photographers had tried for some time in vain to get satisfactory pictures of the snow-clad Alps, seen across the lake, and about seventy miles off in the distance, and that they found that with ordinary methods by far the best time to get satisfactory photographs of them is shortly before sunrise, when they have deeper tints than later on, and have a bright and contrasting background. There is a Photo Club at Neuchâtel, and some of the professors at the University are among its members. The annual banquet of the Swiss Club in Liverpool was held on February 2nd last, and the Swiss Consul, Mr. Ehrensperger, was among those who attended.

Liverpool has long been noted for its hospitality. At the close of a British Association visit, we once heard Professor Huxley speaking thereof at the concluding meeting, more or less, so far as memory serves, to the effect that the Mayor had taken him in a gorgeous chariot, drawn by six cream-coloured horses, and surrounded by splendours to which he was totally unaccustomed, to a fairy palace, where he felt lost as in a dream, and fully expected that on the following morning his host would clothe him in a silken robe, and hand him a purse of golden sequins, in the good old Arabian Nights fashion. The Liverpool Amateur Photographic Association would have carried out that matter even better than the corporation; they would have had him drawn by six red unicorns and a basilisk; they never do things by halves.

The Liverpool Amateur Photographic Association has comfortable rooms of its own, well supplied with photographic literature, and has a dark chamber for the development of negatives. At present the walls of the meeting room are decorated with photographs by Mr. Gibson, of Hexham, one of the most popular photographers in the North of England. His excellent prints have a peculiar tone, due to the employment of Blanchard's platinum toning process.

### The History of Photography in Liverpool.

Liverpool has made its mark in the history of photography. The early work of Messrs. Sayce and Bolton in relation to the collodio-bromide process is well known.

Last Saturday Mr. B. J. Sayce showed us some of his early collodio-bromide negatives and prints. One of them is a positive print taken in 1873 from an old and scratched collodio-bromide negative taken Sept. 3rd, 1864. Another is a negative taken with thirty seconds' exposure on Sept. 5th, 1864. A third, dated June, 1865, is a negative taken on wet collodio-bromide with ten seconds' exposure; the date of another is June 19th, 1865. One of them, dated July 11th, 1865, is a negative of high quality taken at an out-door meeting of the Liverpool Amateur Photographic Association, near Corwen, North Wales. It was acknowledged to be the best in the competition on that occasion. All the other photographers were using dry plates of various descriptions, by the processes then in vogue, with collodion as the vehicle.

The Liverpool Amateur Photographic Association was established in December, 1863, and is stated to be the oldest strictly amateur photographic society in the world; it grew out of the old Liverpool Photographic Society, which broke up because of dissensions between amateur and professional members. The first president of the new Society was the Reverend T. B. Banner, and the first secretary Mr. John Glover; the latter was then well-known in the photographic world; he was a good experimentalist, and the author of a pamphlet on "The Art Bearing of Photography." He died about 1865.

In 1853, at the time of the Crimean War, Mr. John Thomas, of Rock Ferry, photographed the fort at New Brighton from the Lancashire side of the Mersey, at a distance of about three miles, and obtained as good definition as if he had exposed at a distance of a few hundred yards. He had to allow for the difference between the chemical and visual foci of the telescope object-glass employed. A feat like this was a novelty at that time, and it attracted the attention of the War Office.

At the present time professional photographers have no organisation in Liverpool. The existing organisations are:—1. The Liverpool Amateur Photographic Association. 2. The Liverpool University Photographic Society, established about two years ago; in this Society Dr. Kohn, Professor of Chemistry at University College, is an active member. 3. The Photographic Society, established about two years, connected with the Liverpool Young Men's Christian Association. 4. The Birkenhead Photographic Society, which holds its meetings on the south side of the Mersey. 5. The Wallasey Photographic Society, which holds its meetings on the south side of the Mersey, near Birkenhead; its president is Mr. H. Wilkinson, Massey Park, Liscard, Birkenhead.

Mr. J. A. Forrest is usually considered to be "the father of photography in Liverpool." His experience in the subject dates from about the time of Daguerre's discovery. He is an amateur, and was a glass manufacturer, but some time ago retired from business. He published, in January, 1888, in the *Liverpool Mercury*, some "Historical Notes of what Liverpool has done in the art-science of photography from its discovery in 1839 to the present jubilee year of photographic discovery, 1888." All the rest of this article is an abridgment of the said memoir by Mr. Forrest:—

Soon after 1839, the date of Daguerre's discovery in France, and the time when our countryman, Mr. Fox Talbot, produced a process on paper made sensitive by the salts of silver, Mr. Spencer, carver and gilder, in Slater Street, Liverpool, who afterwards became the discoverer of electro-plating, erected a photographic studio on St. James's Mount, and for some years carried it on successfully. Finding the time of his exposures increasing, he asked Mr. Forrest to see his studio, and try to find out the cause of the increase. He did so, and discovered that the glass on the studio roof had changed colour from a greenish tint to pink, arising from manganese forming one of the component parts of the glass; this led to the abandonment of manganese in the manufacture of glass, from its liability to change by the action of the sun's rays.

The moving spirit of progress in Liverpool in the early stages of the art was the late John Atkinson, of Manchester Street, whose shop became the rendezvous of all interested in the new art. He was a man possessing mechanical genius. The outcome of the existence of this general meeting place was the formation of the first Liverpool Photographic Society. Mr. J. T. Foard did great work in the Society by supplying it with papers of high-class merit.

Mr. John Glover, another member, was an indefatigable experimentalist, but, being of a weak constitution, he fell a victim to his own ardour. The Society subscribed £275, and appointed trustees to see it laid out in the education of his children. Mr. Thomas Higgin has devoted his efforts to the department of microscopic photography, and produced works of high merit. No member reached such a high state of perfection in the art as Mr. Osmond R. Green; his pictures were large—some of them 24 inches by 18 inches—and, although taken about twenty years ago by the collodio-bromide process, they command admiration at the present day. Frank Howard, an artist of considerable celebrity, was also an active member. Mr. John M'Innes, the first and most successful discoverer of the mode of coating ships' bottoms with material to prevent plants and barnacles adhering to the iron, rendered service to the Society on many occasions. Mr. James Newlands, the borough engineer, took interest in the Society's welfare. He was president for some time, and, along with Mr. Christopher Bell and Mr. Forrest, became joint proprietors of the *Liverpool Photographic Journal*, the copyright of which was sold to Mr. Henry Greenwood for £56. This sum was handed over to the treasurer to pay the Society's debts. Mr. Charles Cory was the editor. Mr. G. R. Berry, chemist, furnished some valuable papers, especially relating to the evolution of dry-plate photography. Mr. Sheridan, another member, was a lover of nature; he had extensive property in South America, and he was home in this country for some years, during which time he visited various places of note in England. He became a thorough adept in photography, and, with his energy and large means, pushed the Society to the front in every way. In returning to his adopted country, the steamer on which he was a passenger took fire; to avoid a rush for the boats, he strapped a lifebelt around him and jumped into the sea. The occupants of one of the boats searched for him and found him floating, but his spirit had fled. He was a gifted Irishman, greatly respected by every member of the Society.

Dissensions about the question of professional *versus* amateur broke up the old society, and another was started, the "Liverpool Amateur Photographic Association"; the old society also gave birth to a vigorous offshoot in the Birkenhead Photographic Association.

To judge of the value of a society, you must get at the percentage of working members, for in every society there are some "drones," who appear at monthly meetings, question everything, and do nothing. To establish an improvement in this respect, and enable members to estimate their relative skill in manipulation and artistic treatment of subject, the Birkenhead Society holds competitions under equal conditions at out-door meetings.

Mr. Isaac Roberts, of Maghull, is a Liverpool man, who is now engaged in astronomical photography. The old Liverpool society laid the foundation of this work, and the following extracts will show this:—Dr. Edwards, in 1854, read a paper on "Collodion Photographs of the Moon's Surface." He said that the Liverpool Photographic Society, recognising the importance of this subject, and the interest felt in it by the British Association at its last meeting, requested Mr. J. A. Forrest, its secretary, and Mr. J. Hartnup, of the Liverpool Observatory, and himself, to act as a committee for obtaining photographs of the moon by the Liverpool telescope, and to lay them before the present meeting. This committee had produced a large number of pictures with variable success, and some of the most perfect copies were then presented. The telescope is furnished with an excellent equatorial mounting, and clock-work motion of great firmness and steadiness. The object glass has a focal length of about 12½ feet, and a small camera box being substituted for the eye-piece, the image is received upon the ground glass or prepared plate in the ordinary manner. After much fruitless labour, the chemical focus was discovered to be about eight-tenths of an inch beyond that of the visual one, the glass being over-corrected to that extent in respect to its actinic focus. The focus once accurately obtained of course answered for all subsequent experiments, but it was at first difficult to decide whether the want of sharpness of outline observed was due to the motion of the object, or to imperfect focussing. The best specimens were obtained by the continuous motion of Mr. Hartnup's steady hand, in addition to the clockwork movement, while his eye was kept on the finder with an achromatic eye-piece of good power, by which he could maintain the position of a given point in the field. When the moon is off the meridian, her rate being variable, this seems the only mode of following her motion accurately. Such were the mechanical arrangements, and the chemicals which produced the pictures were collodion containing iodide and bromide of potassium, a neutral or slightly acid silver bath (thirty grains to the ounce), and a developing solution of sulphate of iron with acetic or formic acids. The fixing agent was cyanide of potassium. Collodions were employed, containing respectively iodides of ammonium, cadmium, calcium, or zinc, without obtaining any advantage in result; and, indeed, no marked advantage followed the use of very sensitive collodions, which seldom gave both the mapping and the detail on the dark limit with equal distinctness. Mr. M'Innes was successful in copying and enlarging these pictures for the lantern, and the effect of the illuminated images proved interesting at the soirée, when Professor Phillips lectured to the members of the British Association, of which he was one of the founders, in St. George's Hall, Liverpool. The entire image was shown on a screen fifty-six feet in diameter. He said nothing that others had attempted could at all compare with the results which had been obtained by the voluntary exertions of the photographers of the Liverpool Society. The Abbé Moigno, who was present, said that the general impression of his countrymen present was that the Liverpool Society had got farther into the skies than the French photographers had. Strange to say, Gaston Tissandier, in his History of Photography, published in 1878, entirely ignored what had been so ably accomplished by the Liverpool Photographic Society, and gave the credit to Padre Secchi, of Rome; Dr. Warren De La Rue, of London; Mr. Rutherfurd, and Mr. Grubb; none of whom commenced their operations until two years after the successful display at Liverpool in 1854.

Arago had said that photography was one of the most remarkable conquests of genius, and might rank with the telescope and the electric battery; but what would he have said to the following, which occurred at a meeting of the Liverpool Astronomical Society, when a paper was read on "Celestial Photography":—"At a joint meeting of the Literary and Philosophical and Astronomical Societies of Liverpool, Mr. Herbert Sadler, F.R.A.S., read a paper on 'Celestial Photography,' in which he referred to the great advances which had lately been made in astronomy by the assistance of photography. Starting from the first crude and imperfect pictures of the sun and moon, astronomy and photography had marched hand in hand until the present methods of manipulation enabled us to photograph objects which the eye can never hope to see. The paper was profusely illustrated by celestial photographs; and, in calling attention to a picture of Capella, Mr. Sadler explained that the rays which affected the plate started on their errand during the battle of Waterloo. As an illustration of the far-reaching power of the photographic eye, the map of the Pleiades constructed by M. Wolf contained 671 stars, and, after a careful sounding in this direction with the largest telescope in the Paris Observatory, the author felt assured that all beyond was darkness, and that he had absolutely reached the utmost depths of space; but a photograph of the same district taken by the Brothers Henry, with a much smaller telescope, in one hour showed 1421 stars against the 671 which had taken M. Wolf three years to map."

Not until Mr. Scott Archer, a London chemist, discovered, in 1851, a practical method of utilising a solution of guncotton in ether and alcohol, known as collodion, for creating a surface on which sun pictures might be produced with greater rapidity and beauty than formerly, did photography begin to make giant strides, and during a period of thirteen years his principle of a nitrate of silver bath as a sensitiser remained in force. But the times were marching on to greater development, and it was by the hand of the 1888 president of the Liverpool Amateur Photographic Association, Mr. B. J. Sayce, that the first practical negative emulsion process, which he called collodio-bromide, rendered the manufacture of dry plates simple, trustworthy, and inexpensive. This process was introduced in September, 1864, and after several modifications by the author, the principle of emulsion *versus* the nitrate bath revolutionised photography, and enormously increased the army of amateurs. Various improvements in manipulation have been introduced, and bromide emulsion is the process of to-day, but the vehicle for the suspension of the silver salts is gelatine. Twenty-one years later the jury of the International Inventions Exhibition, held at South Kensington in 1885, granted to Mr. Sayce a gold medal and diploma for the discovery.

---

Messrs. York and Son are keeping pace with the times by turning out lantern slides relating to the life of John Wesley at this, his centenary epoch.

Photographs on Looking-Glass.—Mr. Marcus Guttenberg, of Manchester, has sent us for inspection some of his coloured photographs on mirrors, produced by a process described a few weeks ago in our patent reports. Those with sharp edges somewhat resemble the paintings on glass now so common, and in which the effects of reflection at the edges are prominent and do not agree with each other, like the natural tail of the organ-grinder's monkey, and the tail of the red coat in which the little innocent is dressed. In another class of pictures by Mr. Guttenberg this objection is not prominent; he, in this case, first deadens the front surface of the mirror with hydrofluoric acid, then applies an oval background, getting pictorial results somewhat better than we chance to have hitherto seen on mirrors.

## PHOTOGRAPHIC CHEMISTRY.

### I.

Last Monday night Professor Meldola delivered the first of three lectures at the Society of Arts on "Photographic Chemistry." Mr. Francis Cobb presided.

The lecturer stated that of late years the applications of photographic processes in art and in science have been numerous. Photography now claims to be a branch of science, and that it should be taught as such; indeed, some progress has been made in this direction at certain schools and colleges in this country, but not nearly to the same extent as at the Technical High Schools of Berlin and Vienna. In this matter of education, it must be admitted, we have taken a secondary position, although this is the country of most of the great discoveries in photography since the days of Niepce and Daguerre; silver printing on paper, the blue process, bichromated gelatine processes, pigment processes, emulsion processes, and Willis's platinotype process originated here. Photography also has its physical side, and that should be taught in a scientific manner.

In some minds the idea of technical training is connected exclusively with the teaching of handicrafts, but this is a mistake, and especially so in relation to the training of photographic technologists.

One might begin the training by teaching the student the action of reducing agents upon silver salts. By adding ferrous sulphate to silver nitrate in a test tube, he would find silver to be precipitated as a grey deposit, finely crystallised. He might then be made to prove by tests that the deposit is really metallic silver. He might be instructed as to the action of reducers upon silver haloids, and that by submitting reduced silver on paper to action of solutions of gold or platinum, the dark deposit becomes more insoluble in nitric acid, proving that more or less of one of those metals has been substituted for the silver. He might be taught that the reducing agent becomes oxidised while doing its work, and how to prove this point in the case of an iron developer by the application of the ferrocyanide of potassium test.

It is believed that silver can be thrown down in different states of aggregation; ferrous sulphate throws it down from the nitrate in a grey crystalline state, but ferrous acetate throws it down from the nitrate in a fine and black condition. Such phenomena as these do not find expression in ordinary text-books; the deposit is said to be metallic silver in both cases, but in the last one there may be some trace of organic matter with the silver. Faraday has shown different forms in which gold can be precipitated, but on the other hand, silver and its salts have a special tendency to bring down traces of foreign matter. Similar actions occur in dyeing. Mr. Roberts-Austen has shown how the most minute traces of an impurity in a metal will sometimes affect the physical characteristics of the whole mass. In the case of Carey Lea's deposits from the organic salts of silver, the lecturer did not think that there was sufficient evidence that the precipitates consisted entirely of pure silver. Carey Lea had analysed some of the precipitates, and found in them 98·75 per cent. of silver, but Mr. Roberts-Austen had shown that two-tenths per cent. of lead in gold were sufficient to make gold brittle. A Dutch chemist, who has been repeating Carey Lea's experiments, and analysing the deposits, says that the latter always contain traces of iron as an impurity.

The student might be made to study the various actions of sodium thiosulphate upon silver nitrate. Silver thiosulphate, $Ag_2S_2O_3$, may be formed by adding the sodium salt to silver nitrate, and taking care to keep the latter in excess; in the presence of water the product gradually changes into silver sulphide and sulphuric acid. The soluble double salt, $Ag_2Na_2(S_2O_3)_2$, is formed by adding the silver solution to the sodium solution until a permanent precipitate is formed; this also tends to decompose with the formation of sulphide. The other salt is a soluble one, $Ag_2Na_4(S_2O_3)_3$: this salt is extremely soluble in water, but can be thrown down therefrom in a beautifully crystalline form by suitable treatment with alcohol. The utility of the performance of such experiments as these is obvious when learning the principles of the fixing process.

Professor Meldola then drew attention to the accompanying table, and proceeded to speak of the chemistry of

| Reagent. | AgCl. | AgBr. | AgI. |
|---|---|---|---|
| Cl | No action | AgCl formed | AgCl formed |
| Br | ,, | No action | AgBr formed |
| I | ,, | ,, | No action |
| HCl | ,, | AgCl formed at high temperatures | AgCl formed at high temperatures |
| HI | AgI formed | No action | No action |
| KCl | No action | ,, | ,, |
| KBr | AgBr formed | ,, | ,, |
| KI | AgI formed | AgI formed | ,, |

the silver haloids. These haloids, especially the iodide, are soluble to some extent in strong silver nitrate; by considerably heating nitrate of silver in a test tube, he made it dissolve a large amount of silver iodide, which was precipitated again by the addition of water.

If silver nitrate be cautiously allowed to fall, drop by drop, into strong hydrochloric acid, the latter will dissolve a little of the former, and no precipitate will be formed; in other words, freshly precipitated silver chloride is soluble in hydrochloric acid to the extent of one-half per cent. When some of this solution is poured into water, a precipitate appears. The lecturer next added exceedingly weak solution of silver nitrate to largely diluted hydrobromic acid. In this case bromide of silver was formed in so fine a state of division that with long standing the particles did not fall to the bottom of the containing vessel.

## THE SCIENCE OF COLOUR.

AT the fourth of the course of lectures on this subject, given on Friday last at the rooms of the Society of Arts, Captain Abney commenced by referring to the statement at the previous lecture that any colour could be described in terms of the spectrum, *plus* some given proportion of white light. Purples, however, could not be directly described in this way, because there is no part of the spectrum which represents purple. They could, however, be expressed in terms of their complementary colour and white light.

The eye could not tell to what parts of the spectrum a colour truly belonged. It could only recognise an impression of the colour as corresponding with some part of the spectrum. This was illustrated in several ways, particularly by spectrum red and green being thrown on to a white surface to produce the effect of yellow. That it was not the same as the yellow produced by transmitted white light through a yellow medium was shown by patches of various colours being held in the two. This comparison was farther made by placing the several colours in the simple spectrum yellow, and in the yellow shown by ordinary filtration through the coloured medium.

The lecturer then spoke of primary colours. He said that there was more ignorance on this subject than on any other connected with light. It had been commonly taught that there are three primary colours—red, yellow, and blue. Taking primary colour to mean colour which could not be obtained by compounding others, there was one only of this triad, red, that was entitled to be called primary. Yellow was certainly not primary, as it could be made by green and red; and blue also could be made with violet and green. This was shown by experiment. Violet, green, and red were three colours that could not be produced by compounding others, and therefore these were the three primary colours. How was it that people had so generally gone wrong in their ideas of primary colours? It was because until the present age all knowledge of colour had been in the hands of the artists, who had to use impure colours. They were not aware of the laws of absorption. By superposing a yellow and blue screen, a green patch of light was seen to pass through them. This method was identical with that of the artists. In using mixed pigments, they had colours finely ground lying one on the top of the other, and seen through one another, or reflecting colours from one to the other.

# Patent Intelligence.

### Applications for Letters Patent.

3,263. J. C. L. DURAND, D. E. HUGUENIN, and A. J. J. D'ANDIRAN-KOECHLIN, 28, Southampton Buildings, London, "Manufacturing Colouring Matters from Pyrogallic Acid."—February 23rd.

3,465. J. PUMPHREY, 160, Augelina Street, Birmingham, "Cameras."—February 26th.

3,623. D. A. CROMBIE and E. R. FLETCHER, 96, Buchanan Street, Glasgow, "Lantern Slide Masks and Binders."—February 27th.

3,627. T. J. SMITH, Jr., 4, Clayton Square, Liverpool, "Appliances for Optical Lanterns."—February 28th.

3,648. J. BRADLEY, 53, Arcade Chambers, Manchester, "Cameras."—February 28th.

3,727. W. CHEFFINS, 34, Southampton Buildings, London, "Puppets for Magic Lantern Displays, and Mechanism for actuating the same."—March 2nd.

3,781. C. C. GILL, 5, Hornsey Rise, London, "Cameras."—March 3rd.

3,823. T. E. C. WILSON, 6, Lord Street, Liverpool, "Cameras."—March 3rd.

3,866. T. SCOTT and J. DAVENPORT, 70, Deansgate, Manchester, "Camera."—March 4th.

3,876. A. M. GILLHAM, Oak Lodge, Wellington Road, Wanstead, "Photographic Apparatus."—March 4th.

3,942. J. NAYLOR, 17, Southampton Buildings, London, "Photographic Apparatus."—March 5th.

3,950. W. J. SPURRIER, 3, Queenswood Road, Moseley, Birmingham, "Cameras and Stands."—March 5th.

4,040. S. H. CROCKER, 172, Fleet Street, London, "Improved Means for Producing Photographs in Colours."—March 6th.

4,049. E. L. PERKEN, E. T. PERKEN, and A. RAYMENT, 99, Hatton Garden, London, "Camera Stands."—March 6th.

4,062. W. P. THOMPSON, 6, Lord Street, Liverpool, "Improvements in Photography."—March 6th.

### Specifications Published.

585. *January 12th*, 1891.—"Photographic Cameras." SAMUEL CALVERT, of Great Ormond Street, London, Artist. (Communicated from abroad by THOMAS ARDERN, Camera Maker, Melbourne, Victoria.)

This invention relates to the construction and arrangement of photographic cameras of field-glass form in such a manner as to afford great convenience in focussing, in working the shutters in accommodating a number of plates, and exchanging exposed for fresh plates.

The inventor claims:—

1. A photographic camera of field-glass form, having in front a pair of lens holders with shutter-box attached thereto, and their sliding tubes adjustable for focussing, and having in rear two compartments, the one compartment arranged to hold a pile of sheathed plates, or films, and advance them for

exposure in succession, the other compartment arranged for focussing and for transferring each plate in succession from the front to the rear of the pile.

2. In combination with the two compartments above referred to, a spring push with non-actinic glass for the one and a hinged door for the other, arranged and operating for transferring a plate from front to rear of the pile.

3. The modified construction and arrangement of the rear compartments and their appliances for transferring plates, substantially as described.

4. In combination with the focussing compartment, an adjustable eye-piece with objective lens.

5. In a photographic camera, the combination of a rotatable lens holder and coiled spring with a pair of sliding shutters having transverse slots engaged with eccentric studs on the lens holder, so that on the release of a trigger, or detent, the lens-holder is caused by the spring to make a partial revolution, opening and then closing the shutters.

6. In a field-glass camera, in combination with the shutter apparatus referred to in the preceding claim, a sliding shutter for the focussing aperture moved by crank and gearing from the rotatable lens-holder, aud a trigger with its pin and spring arranged within the tubular focussing screw.

2,150. *February 10th*, 1890.—"Improving the Appearance of the Human Body." (This patent might have been entitled "Retouching the Sitter.") Patrick Rowley, Curraghmore House, Hessle Common, Hull, Merchant Tailor.

My inveution has for its object to provide an appliance for improving the figure or appearauce of, and coucealing deformities in, the human body, and consists of an instrument or device to be applied to the shoulders of the wearer, whereby the coat or other outer garment is caused to present a graceful and uniform appearance.

According to my iuvention, I provide a rod or wire of any suitable material, preferably of a flexible nature, such, for example, as steel, and of a form to surround the back part of the neck of the wearer; the ends of the said bar or rod are made to extend to the front, and are so bent as to lie snugly against the upper part of the chest. Fitted to slide on this bar or wire are two collars or sleeves, to which are hinged epaulets or shoulder-pieces, suitably shaped to represent gracefully-formed shoulders, which, when worn beneath the coat or other outer garment, give to the said garment a neat and graceful appearance. These epaulets or shoulder-pieces may be made of any suitable light, and preferably flexible, material, such, for example, as steel, tin, leather, gutta-percha, vulcanite, or the like, and they may be padded on the interior with wool or other suitable material, so as to cause them to set comfortably on the shoulders of the wearer. By hiuging these epaulets or shoulder-pieces to the rod or wire, as described, they admit of the free movement of the arms of the wearer without inconvenience, whilst deformities of the shoulders of the wearer are effectually concealed, and a graceful appearance is given to the coat or other outer garment.

5,193. *April 3rd*, 1890.—"Photographic Cameras." George Dickinson, 144, Morley Avenue, Noel Park, London, N., Photographic Salesman.

This is the radial camera already described in these pages. The inventor claims:—

1. In a magazine plate changing camera, the combination of a turntable plate-holder having diametrical plate-holding grooves, with a magazine having sets of plate-holding grooves radial to the axis of the turntable holder, with any of which the grooves of the turntable holder may be made to register.

2. The combination, with the turntable holder and radial magaziue, as described, of the indicator for denoting the position of the turntable holder with regard to the magazine, and for fixing it in that or in the exposing position.

3. The combination, with the turutable holder and radial magazine, as described, of the axially-operated spring stop for retaining the plate in the turntable when turning the same.

4. The combinatiou, with the turntable holder, of the abutments for preventing the passage of light past the plane of exposure.

5,215. *April 3rd*, 1890.—"Instantaneous Shutters." Francis Beauchamp, The Poplars, Chadwell Heath, Essex, Engineer.

This invention relates, firstly, to improvemeuts in the construction and arrangement of instantaneous shutter mechanism in which the shutter is intended to work in the ordinary diaphragm slit of a photographic lens.

The invention relates, secondly, to improvements in mechanism for regulating the time occupied in opening and closing instantaneous shutters.

The invention relates, thirdly, to improvements in the operating mechanism of instantaneous shutters whereby a number of exposures, with any desired interval of time between each, can be made with one winding up of the shutter actuating spring.

5,458. *April 10th*, 1890.—"Detective Photographic Cameras." Henry Robert Hume, 6, Allen Terrace, Kensington High Street, London, W., Dentist, and Edward William Parfitt, 18, Gatcombe Road, Tufnell Park, London, N., Musician.

This invention relates to improvements in hand or detective photographic cameras, aud has for its object affording increased facility for successively bringing into position the sensitive films or plates employed.

According to our invention, we mount each of the sensitive plates or films within the well-known holders or carriers, preferably coustructed of thin sheet metal or other suitable material, and provide each of the said holders or carriers with a pin or pins projecting laterally from each side of the upper part thereof, for the purpose hereinafter described. Within the outer case of the camera is a sliding frame or tray, the upper edges of the sides of which are provided with corresponding equidistaut notches or slots.

The sensitive plates, contained within their respective holders or carriers, are placed one above the other in a horizontal position, the projecting pin or pins of the lowermost holder or carrier engaging with the rearmost notch or slot upon each side of the sliding frame before referred to, whilst the front of such holder or carrier is supported by a convenient stop or stops carried by the case.

The said sliding frame or tray is connected with a suitable arrangement of mechanism operated from the exterior of the case, which we shall hereinafter describe, in such manner that it may be shifted backwards (or away from the lens) by successive operations, a sufficient distance at each time to free the lowermost holder or carrier from the before-mentioned stops supporting one end thereof, and allow it to swing upon its projecting pin or pins and drop into a vertical position, at the same time bringing the next pair of notches or slots in the upper edges of the sliding frame beneath the projecting pins of the next holder or carrier, and so on throughout the series.

9,118. *June 12th*, 1890.—"Photographic Apparatus." (Communicated from abroad by Dr. Rudolph Krugener, of Bockenheim, near Frankfort-on-the-Main, Germany.) Henry Harris Lake, of the firm of Hazeltine, Lake, & Co., Patent Agents, 45, Southamptou Buildings, London.

This invention relates to photographic apparatus, and comprises devices for exposing, measuring off, winding up, numberiug, and cutting off sensitive celluloid film which is wound upon a roller.

This pateut cannot be adequately described without the drawings.

The Photographic Club.—Subject for March 18th, "Testing Speed of Shutters"; March 25th, lantern night. Visitors invited.

Exhibition of Collotype Prints.—The walls of the rooms of the Photographic Society are hung with between two and three hundred examples of collotype printing sent for exhibition by The Autotype Company, The London Stereoscopic Company, Messrs. Bemrose and Sons, of Derby, Rommler and Jonas, of Dresden, L. Ronillé, of Paris, F. Thevoz and Company, of Geneva, and Waterlow and Sons. The exhibition will remain open for a month, for the inspection of visitors who present their cards. The pictures were originally lent for the illustration of Mr. Warnerke's lecture, which we published last week.

## Correspondence.

THE NATIONAL PHOTOGRAPHIC EXHIBITION.

Sir,—I have the pleasure to hand you herewith our list of [ju]dges for the ensuing exhibition, and I should be obliged if [yo]u will notify your readers that appplications for space will [be] received up to Monday, 30th inst., a week later than [pr]eviously announced.

Judges:—Messrs. Frank Atkinson, Val. Blanchard, F. P. [Ce]mbrano, F. M. Good, Frank Howard, P. H. Newman.

Lantern and Scientific.—Messrs. G. Baker-Creswell, T. E. [Fr]eshwater, Comd. C. E. Gladstone, R.N., E. M. Nelson, R.M.S.

S. G. Buchanan Wollaston.

*Crystal Palace Company, Crystal Palace, S.E., March 8th.*

## Proceedings of Societies.

The Photographic Society of Great Britain.

[At] the ordinary meetiug of this Society held on the 10th inst., [th]e chair was occupied in the first instance by Mr. J. Glaisher, [pr]esident, and during the latter part of the meeting by Mr. [A.] Spiller, vice-president.

A paper on "Standard Registering Slides and their Mode of [Us]e" was read by Sir David Salomons, and illustrated by [ex]amples. He poiuted out the desirability, iu an instrument [wh]ich now had acquired such a scientific value, of being able [to] register at once aud truly all slides that might be used with [it]. For this purpose it was at one time the custom to adjust [th]e stops by means of picture subjects. A better plan had [be]en introduced by Messrs. Steward, by using "Standard [Re]gistering Crosses," but for exact work he had uot found [the]se sufficient, and uow showed a set of registering plates [rul]ed with squares having an upright and vertical line through [th]e centre. By etching these squares it was practicable to [pro]duce a number alike, so as to preserve the staudard. The [bot]tom of each glass was true, and so was one end, that which [lo]cked against the stage stop. After explaining and showing [the]se standards, the three lenses of a triple lantern were set by [hi]m, and various "effect" slides passed through. These [slid]es were of high quality, and the registering excellent.

[T]he Chairman (Mr. Spiller) expressed his interest in all [im]provements of the lantern; he had, he said, been admitted to [the] secrets of the Polytechnic lantern arrangements in the time [of] Mr. Pepper. He believed that Mr. Debenham had some [col]our screeus, and called upon him to show them in the lanteru.

[M]r. W. E. Debenham said that it had beeu suggested that [the] members might be interested to see these screens projected, [as] they had been recently at another society. The first set [con]sisted of three discs partly overlapping on the screen—red, [gre]en, and blue respectively—and it was particularly pointed [out] that where green and red light came on the same place the [effe]ct was yellow. Green, which was formerly supposed to be [com]pounded of blue and yellow, could not be thus formed. [Blu]e and yellow screens were used to show that the effect of [the] two lights combined was to produce, not green, but white. [The]n, for the comfort of those who knew that blue and yellow [did] make green—for they often made that colour by mixing [the] two first-named—a slide was shown in which films of these [colo]urs overlapped, and the overlapping part showed as green. [The]re was not time that night to go iuto the explanation of [wha]t might seem, to the uninitiated, contradictory; but he [had] undertaken to deal more fully with the subject at a meeting [of] the London and Provincial Photographic Association, and [the] well-known hospitality of that body justified him in saying [tha]t any members of the Photographic Society of Great Britain [who] might be interested would be welcomed.

[M]r. Chapman Jones asked Sir David Salomous whether the [hea]t of the lantern was not sufficient to put slides out of true [regi]ster. With regard to Mr. Debenham's colour slides, he [tho]ught members might iufer that all yellow was a compound [of] red aud green, whereas there was a simple spectrum [yell]ow.

Mr. Debenham did not intend to convey the idea that all yellow was composite. He had been limited by time on this occasion, and done little more than show the effects.

Sir David Salomons said, in reply to Mr. Chapman Joues's question, that the warmth of the lantern would slightly alter the true register; also the temperature of the room in which the slides were kept. He therefore recommended that, before an exhibition, all slides to be used should be for some time in the room, so they should be of equal temperature.

The Chairman proposed votes of thanks to Sir David Salomons and Mr. Debenham, and, these being accorded, it was giveu out that at the technical meetiug ou March 24th, the subject of haud-cameras would be discussed, and it was desired that members should bring their own apparatus of this kind, so that comparisons of many patterns might be made. March 31st is to be a lantern night; members are requested to bring slides. On April 14th Mr. W. Willis is to read a paper on "Platinotype." At the technical meeting of April 28th animal photography will be discussed, and on May 12th a paper will be read by M. Leon Vidal on "Photographic Methods of Obtaining Polychromatic Impressions."

Messrs. C. Braham, W. Grove, G. McDonald, and H. Young were elected members of the Society.

The London and Provincial Photographic Association.

Mr. A. Collier iu the chair. Several presentations of books were made to the library.

The Hon. Secretary reported about the meetiug he had attended at the rooms of the Photographic Society of Great Britain on behalf of the Association on the subject of the federation of London Photographic Societies.

Mr. Haddon spoke about the necessity, when experimenting with developers, of knowing the condition of the sulphite used. Different samples of sulphite would influence results. It was, therefore, of great importance in comparing developers to be quite sure that the sulphite used was neutral.

Mr. P. H. Newman then read a paper on "Pictorial Composition (see page 203).

The remainder of the evening being occupied with lantern illustrations in connection with the paper, a discussion was not taken.

A vote of thanks was unanimously accorded to Mr. Newman for his very able lecture.

The South London Photographic Society.

*Friday, March 6th.*—Mr. Edwards in the chair. Mr. W. Groves read a paper on "Shutters," illustrated by three sheets of diagrams to show the efficiency of various forms of shutters. Messrs. Marion, Houghton, and Watsou leut specimens of shutters; the members also brought several, so that about twenty were on view.

The Society resolved to enter for the Challange Cup at the Crystal Palace.

The North Middlesex Photographic Society.

*March 9th.*—Mr. Goodhew in the chair.

In the unavoidable absence of Mr. Friese Greene, who was to have addressed the Society upon "A New Sensitive Salt," the eveniug was devoted to Society business.

A field day at Rickmansworth was arranged for Easter Monday. Visitors who wish to join the party are requested to communicate with the secretary.

The Richmond Amateur Photographic Society.

*Friday, 6th inst.*—Lautern night; Mr. F. P. Cembrano presided.

Mr. C. Hussey, of Croydon, gave a demoustration of the collodio-bromide process, and, after a few general remarks upou lantern slide work, and the advantages he claimed for his favourite process, went on to describe the *modus operandi*. His practice was to use no mineral acid in cleaning, and no substratum iu coatiug the glass, for fear of contaminatiug the emulsion. Next, three plates were successively exposed, developed, and fixed, and the demonstrator proceeded to illustrate the advantage which he claimed for his process, namely, that whereas a gelatine plate, after development and fixing, passes practically out of control, a collodio-bromide plate is, at that stage, as a cliché to work upon, being readily susceptible of being made to give almost unlimited variation in density and tone.

After a few remarks from the Chairman on the merits of rival processes, some slides by Mr. Hussey were exhibited by means of the lantern, and presented a large range of tone. Slides by Messrs. Williams (a visitor), Ardaseer, Lowry, Davis, Ennis, Irvine, Hodgkin, and Cembrano were then displayed.

The next meeting will be held to-night; the subject is "Photometers and Actinometers."

The Lewes Photographic Society.

*March 3rd.*—The President in the chair. Demonstrations were given as follows:—Mr. J. G. Braden, "Matt Surfaced Prints Toned with Platinum"; Mr. J. Tunks, "Silver Prints Toned with Gold"; Mr. G. J. Wightman, "Hot Bath Platinotype." Great interest was taken in the demonstrations, and specimen prints by each process were shown.

At the next meeting, on April 7th, there will be a lantern slide competition; this will be the last lantern night of the season.

The Sheffield Camera Club.

The opening meeting of the session was held on Friday evening, March 6th, and took the character of a social evening.

The President, Mr. G. T. W Newsholme, in the course of his remarks, made reference to the aims and objects of the Club, pointing out that the science of photography could be promoted by the comparison of work and discussion of the various methods of production, without the stimulus of competitive exhibitions. He held that the production of good work should be sufficient reward in itself. There was an excellent exhibit of work by members during the past year.

During the evening an exhibition of slides by limelight took place. Cameras, stereoscopes, and photographic apparatus of all kinds were also exhibited.

Enfield Camera Club.—At a committee meeting held on the 24th ult., it was resolved that for members residing outside a radius of ten miles from Enfield, the subscription shall be reduced to two shillings and sixpence per annum. The following is a programme of the meetings to be held up to the 15th April:—March 18th, demonstration on "Platinotype," Mr. R. B. Lodge; April 1st, demonstration on "Bromide Enlarging," Messrs. Fry and Co.; April 15th, lantern night.

The Formation of an Explosive Substance from Ether.—Professor P. T. Cleve has written a letter to the Chemical Society, in which he describes a remarkable explosion occasioned by impurities in commercial ether. On distilling about 250 c.c. of the ether, it was noticed that a viscid residue remained; after drying on the water-bath, this formed a transparent, amorphous mass, estimated to weigh about 0·75 grm. Prof. Cleve states that, having poured a little water on to the substance, he proceeded to stir it gently with a rounded glass rod; this occasioned a most violent explosion. A number of the pieces of glass which were projected about perforated the windows just as if they had been revolver bullets. The explosive substance was probably ethyl-peroxide, as it gave the well-known perchromic colouration, besides liberating iodine and discharging oxygen from silver oxide; it was at once destroyed by reducing agents; it exploded with as much violence as if it had been chloride of nitrogen or fulminate. Professor Dunstan remarked that several cases had been recorded of explosions during the distillation of impure ether, one a few years ago by Schaer in the *Archiv der Pharmacie* for 1877.

H. W. (Felouita de Mallorca, Spain).—Glad to hear from you again. Such circumstances are not suitable for printing unless publicly authenticated by names and addresses, and evidence strong enough to hang a man in a court of law. The enclosure has been burnt as desired.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

The Photographic News is the oldest weekly photographic newspaper. See its consecutive number to-day on the front page.

J. E. H.—*Photo-Spectroscopic Apparatus.* A pair of quartz prisms and meniscus lens are absolutely essential if you want to photograph the most refrangible rays of the solar spectrum, and it is further necessary to wait until midsummer, and for the clearest weather, in which to prosecute such researches. See Mr. Crookes' spectrum camera figured and described in the *Journal of the Photographic Society*, vol ii., page 293. Much preliminary work could, however, be done towards getting your apparatus in order, and testing the capabilities of your photographic media. Do you intend going out to Zermatt, the peak of Teneriffe, or other elevated station, so as to take advantage of the more rarefied state of the atmosphere?

A. M. M.—*Calculations of Cost.* The wisest course is to appeal to some high authority of greater professional experience, and this we have done. Later on we hope to give you such a report.

J. R.—*The Manual of Photo-Engraving, &c.*, can be had either of Messrs. Hampton, Judd, and Co., 14, Duke Street, Adelphi, W.C., or Messrs. England Brothers, 25, Charles Street, Royal Crescent, Notting Hill, W. Send a postal order for five shillings.

C. E. Webber.—*Mr. Warnerke's Lecture.* As you say, we had a very interesting meeting last week, and we are glad you availed yourself of the opportunity of being present. Noting the fact mentioned in your letter, we may, perchance, find occasion to refer to you as being prepared to undertake this class of work.

C. Holliday.—*Tottenham Loan and Fine Art Exhibition.* Our thanks are due for sending us a copy of the regulations governing the loan collection, which is to be exhibited for ten weeks subsequent to April 15th next. We are glad to learn that photographs will be included.

G. G. M. (Edinburgh).—The portrait was forwarded to you last week, and by letter, just received, has been duly acknowledged.

W. S. B. (Boston, Mass.)—*Life-sized Heads.* You will find one of the points answered in the News of February 27th, in reply to your fellow citizen, A. D. We are expecting to receive definite information on the specific matter which stands over, even now, unanswered.

Unit.—*The Acetate of Amyl Lamp.* 1. If you have any difficulty in procuring the lamp in this country, send over to the French maker, M. Pellin, 21, Rue de l'Odéon, Paris. Burn the lamp under a hood, or within a fume chamber, so as to avoid inhaling the vapours, which often cause headache. 2. The International Congress will meet this year in Brussels, about the third week in August, and resume the consideration of a number of questions left open from last year's programme, and take in hand any fresh matter that may arise.

Tom Don.—*Artistic Copyright.* By the Act of 7 George III., cap. 38, sec. 7, which deals with the copyright in engravings, protection is given for twenty-eight years after publication. As this period expired about eleven years ago in the instance mentioned in your letter, you are at liberty to copy the print. The Copyright Act of 1862 does not affect your case. For reference in doubtful cases, you cannot do better than consult "The Law of Artistic Copyright," by R. Winslow, which, unlike many legal treatises, is brought down to the comprehension of ordinary mortals.

C. B. K. (Derby).—*Reversing Mirror.* Enquire of Mr. Ahrens, Selhurst Villa, King's Road, Kingston-on-Thames.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1698.—*March* 20, 1891.

CONTENTS.



## HELIOCHROMY AT HOME.

A popular idea is current, to some extent, that, in order to try experiments with Professor Lippmann's process, costly apparatus is necessary, including an electric lamp, and an optical system for the casting of a pure spectrum, assuming pure colours to be necessary. The pure blue colour of the spectrum, however, is one of those which can be obtained by transmitting daylight through suitably coloured glasses. Mr. H. G. Madan has discovered that if a piece of Chance's "signal green" glass be laid upon a piece of rich cobalt blue glass, the two together transmit only the pure blue of the spectrum. In all such devices, the depth of colour of the glasses should bear some proportion to the intensity of the incident light, for, when sufficiently thin, all coloured films are practically colourless and transparent. A tolerably pure red is transmitted by oxide of copper ruby glass.

As the photographic films used are most sensitive to the blue rays, the novice in the process may well confine his attention at first to the taking of blue prints, and obtain a pure blue light to work with by means of the two sheets of glass just described. He will require, in addition, but M. Lippmann's mercurial trough, already pictured in these pages, and one or two other simple appliances. The blues thus photographed will not resemble pigmentary blues, but possess a metallic iridescent lustre, in some cases, perhaps, like the blue in the tail of a peacock, in others like the blues sometimes seen upon steel, and so on; in fact, by discovering how the shade of colour varies with different emulsions, colloid vehicles, developers, and modes of the treatment, the experienced photographer is likely to aid considerably in the practical development of the new discovery.

An idea is current that when light strikes the reflecting mirror at an angle, it is reflected in another direction, so that the waves do not come straight back upon themselves to produce interference phenomena. There is some force in this, but its utterers forget the excessive thinness of the dry sensitive film with which they are dealing, and that that thickness can only be advantageously increased up to a certain maximum. Theoretically, no doubt, the more the rays fall at a right-angle to the plane of the plate, the better. In printing by blue light, it might be well to put the blue screen in an aperture of one end of a long diaphragmed box blackened inside, and the mercury trough and sensitive plate at the other, so as to work with rays as nearly parallel as can be conveniently obtained. In trying to print from a negative in this way, a disadvantage of Professor Lippmann's process would come in, for the printing would have to be done through the glass of the sensitive plate, so there would be blurring, but less than many would expect if the glass be excessively thin. Perhaps, at first, the experimenter might simply gain experience in photographing different shades of blue, and when he becomes expert he may abolish the mercury trough, and use plates of polished silver bearing sensitive films; he can then print on a surface in close contact with the negative, and, in addition, get more brilliant colours, because silver reflects light more powerfully than does mercury.

A popular error in relation to the process has reached our notice from several different directions. The colours seen in the prints are those of thin plates, so some persons think that there ought to be a tangible thin plate, which they bite if they like, somewhere in the apparatus; others think that a layer of air between the mercury and the film forms a thin plate, and that no colours at all can be obtained if the emulsion be in optical contact with a plate of polished silver. The real hypothesis is, that when light strikes the reflecting surface at or near a right-angle, there is interference close in front of that surface, but we cannot see it in the surrounding general flood of light. Hence the ingenuity of Herr Wiener, who employed nearly transparent sensitive films to search for these interference phenomena, and to make them register themselves inside the film for subsequent examination; hence, also, the ingenuity of M. Lippmann, who has registered colours by interference in the same way; and hence, likewise, the ingenuity of Lord Rayleigh, who published two or three years ago the principles of producing photographs in colours, which M. Lippmann has just proved to be practically true.

## FILM PICTURES FOR THE LANTERN.

Every practical lanternist knows well that his glass lantern slides are by no means the lightest part of his apparatus. They are, indeed, double the weight of negatives of the same size, for of necessity each picture must be protected by its cover glass. And although glass can now be obtained which is as thin as an egg-shell, the question of brittleness comes in, and there is a limit to thinness beyond which it would be foolhardy to go.

This consideration has led many operators to wish that there might be some material other than glass upon which his pictures could be supported, in the same way that the negative maker has long hoped for a similar substance. The demand of the latter has been met in films of various kinds, of which celluloid at present represents the survival of the fittest. The question naturally arises, "Can celluloid be employed for lantern slides?" And it has been answered to a certain extent by the manufacture of celluloid films which have been prepared for that purpose. They have been introduced by Messrs. Hinton, and, as we have lately had an opportunity of trying them, we are in a position to make some comments upon their suitability for lantern use.

These films seem to differ in no particular respect from other celluloid films, except that they are, perhaps, more transparent after fixation than those prepared for negatives. This, of course, is a very necessary feature in lantern slide pictures, in which the slightest haze is so detrimental to good effect. But although the films are transparent enough for lantern purposes, the celluloid retains a yellowness which seems to be inherent in that material. This tone is not pronounced enough to constitute an actual bar to the use of celluloid as a support for lantern pictures, and provided there is plenty of light available, as there always is with a good lime-lit lantern, it would be hardly noticeable on the screen. So that we may say broadly that celluloid lantern pictures, so far as their production and development are concerned, can easily be prepared. We have next to consider how far their use possesses advantages over glass slides which would cause them to supersede the older material.

The particular films which we have submitted to trial are cut to the standard size for lantern plates, and they exhibit a common characteristic of celluloid films in assuming a curved form when dry, caused probably by the gelatine surface shrinking to a certain extent, for the concave side is always that upon which the emulsion lies. This is the first mechanical difficulty which their use entails. Experiment shows that, when the film is submitted to warmth, the curve becomes more decided, and in a few seconds the picture is actually cylindrical in shape. Now the heat from a lime-lit lantern is so concentrated on the slide by the action of the condensing lenses, that it is impossible to handle a glass picture comfortably if it has remained in position beyond a minute or so. A celluloid picture under the same conditions, and held in a carrier, becomes so bulged that it is difficult to remove from the grooves, while, at the same time, it is of course forced out of focus. These considerations would, therefore, seem to indicate that such pictures cannot be used unless the lantern be furnished with an alum tank, or some other means by which the heat rays cannot affect them. But, supposing that this first difficulty be conquered, there remains another formidable one in the difficulty of keeping the film clean and free from dust. With an ordinary glass picture there is no difficulty here, for it can be breathed upon and polished with a leather on both sides, and good operators know well the advantage of thus keeping their slides bright and clean. But we dare not for a moment treat a celluloid film with such roughness, unless, indeed, each picture is furnished with a cover glass, and then, naturally, the chief advantage in employing celluloid—its light weight—is at once counteracted. Talc, if it were possible to obtain it of sufficient clearness and freedom from cleavage marks, would certainly answer the purpose of a covering material, and it is also a good heat interceptor; but, granted these conditions, it would furnish at once a better support for the sensitive film than celluloid itself. One more consideration, and an important one to reckon with, is that the newer material is more expensive than glass.

We are, therefore, compelled to admit that until manufacturers find it possible to make celluloid which shall preserve its flatness in all temperatures which are likely to assail it in lantern use, and can give us some protecting medium to take the place of a cover glass, it cannot hope to oust glass from its place as a material for lantern pictures. We hope and believe that these difficulties, like most mechanical problems, can be overcome. But when that time comes we may feel quite sure that the ideal method of showing lantern pictures of which many of us have lately dreamed is within reach. We mean the use of a panoramic arrangement of the roll-holder kind, by means of which the operator will be able to reel his pictures into view one after the other by the turn of a handle. We know that the old colossal panoramic pictures, which have been almost wholly superseded by the optical lantern, were wound up in this way, and it seems only reasonable to hope that the same device will be in time adopted by the modern teaching instrument.

At the same time we trust that what we have said will not dissuade any of our readers from putting the new lantern films to practical trial. The heat difficulty, which to us is the gravest, will not affect those who use small instruments. The undoubted advantages which celluloid possesses in the matter of portability, lightness, and freedom from brittleness, will perhaps tempt them to experiment with it, in order to see whether some of the drawbacks which we have indicated cannot in their hands be surmounted.

Newcastle-on-Tyne and Northern Counties Photographic Association.—Next meeting at Mosley Street Café, Newcastle, on Tuesday evening, the 24th March, at 7 30 p.m.; subject, "Bromide Contact Printing."

## ELECTRO-CHEMICAL REVERSALS WITH THIO-CARBAMIDES.

BY COLONEL J. WATERHOUSE, B.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

IN the course of my experiments on photographic reversals with thio-carbamides, it struck me that the complete reversal by transfer of deposit from the exposed to the unexposed parts of the photographic image must be more or less connected with, if not caused by, some electro-chemical action, and that if this was the case it might be possible to obtain similar reversals by means of an electric current.

Becquerel showed, several years ago, that if two silver plates, coated under similar conditions with a haloid silver salt, and arranged so as to form part of an electrical circuit, are immersed in a suitable conducting fluid, the action of light falling upon one of the plates only, and not on the other, is accompanied by distinct electrical action. Professor Minchin has quite recently found that the same rule applies to silver plates coated with emulsions in gelatine or collodion of haloid silver salts, and immersed in very weak solutions of alkaline chlorides, iodides, or bromides. It may, therefore, be taken for granted that the action of light on an ordinary gelatine silver bromide plate is accompanied by more or less electrical action, and it did not seem necessary to repeat these observations.

The next thing to ascertain was whether, during the process of development, there was any similar electrical action between an exposed and an unexposed silver bromide film, or between the different parts of such a film partially exposed and partially covered, sufficiently strong to be detected with a galvanometer. Several attempts were made in various ways with this object, but unsuccessfully—partly owing to the want of a sufficiently sensitive galvanometer. It only remained to try the effect of passing an electric current from a galvanic cell through developers made up with and without thio-carbamides, and the apparatus was being got ready to do so when the PHOTOGRAPHIC NEWS and other journals, received by the mail of 23rd January, brought out the accounts of Professor Minchin's very interesting and important experiments in photo-electricity. From these I found that he had, to some extent, anticipated me by his discovery of the fact that, if silver plates coated with a silver bromide emulsion are attached to the poles of a battery, and half immersed in a weak solution of potassium bromide, the film attached to the carbon pole was visibly blackened on its immersed part, while no visible effect was produced on the other; but on developing this plate with pyrogallic acid and ammonia, its immersed part also became dark, exactly as if it had been exposed to light for a few seconds.

From this result it seemed probable that my own experiment would succeed. I had intended to use platinum plates for the electrodes, as recommended by Becquerel, in carrying out the photo-electrical observations above referred to, but, as the necessary supply of such plates would have been very costly, and pure silver plates were available, they were used, as Prof. Minchin's observations showed that they would answer as well, at any rate for the purpose in hand; but it would be very desirable to repeat the experiments with platinum plates. The silver plates used were about $1\frac{1}{2}$ inches wide and 4 inches long, and fixed, by means of a block of varnished wood, at a distance of about two-fifths of an inch apart. They were marked in varnish with C and Z respectively, so that in these parts the electrical connection between the silver plate and the silver bromide film was cut off.

The developers generally used have been the same as for the photographic reversals, viz., the eikonogen soda (Nicol's formula) or eikonogen lithia, both with sodium sulphite, as given in previous papers on these reversals; also ferrous oxalate slightly acid and with a little bromide. The developers were contained in small vertical glass cells holding about two ounces. The battery used was a small bichromate cell (bottle). A tangent galvanometer (Govt. telegraph pattern) was included in the circuit.

I have tried gelatine silver-bromide films and Eastman's bromide paper in contact with the silver plates, and with all of them have obtained reversed deposition when using an eikonogen developer containing thio-sinamine, but the films were difficult to manipulate and of doubtful character, while the paper increased resistance very largely, and the most decided result, and one which is also quite in accord with Prof. Minchin's observations, was obtained with silver plates treated with bromine water.

A pair of such plates, marked C and Z, and attached to the carbon and zinc poles respectively, were immersed in a plain eikonogen soda developer. A second pair of plates, marked $\frac{C}{TS}$ and $\frac{Z}{TS}$ were immersed in some of the same developer, to which about five drops each of a saturated solution of thio-sinamine and of bromide of potassium at ten per cent. had been added, or about the same proportions as used for the photographic reversals. The film sides of the plates were placed inwards face to face. After immersion in connection with the battery, the plates were washed and fixed as usual.

The immersions of the plates and passage of the current were, in all cases, carried on in the dark, and thus the results are in no way *photographic.*

The C plate showed fairly clear of deposit, but was slightly blackened, especially where the plate had not been quite clean; the top immersion edge was darker, as with reduced silver. The immersed part of the back of the plate was darker than the front, and also had a black edge at the top.

The Z plate showed a very strong dark deposit all over, with a clear line at the top. The varnished Z did not seem quite free from deposit. The back of the plate was also quite dark with deposit. This accords with Prof. Minchin's observation that the film in contact with his similar silver plate attached to the zinc pole was developable, though it had no visible image on it, being only immersed in potassium bromide solution.

Of the other two plates, $\frac{C}{TS}$ showed a strongish black deposit, with a dense black line at the top, and then a clear band above. The back of the immersed part was *very black*, with a light line at top. The black deposit looks like a silver sulphide.

The $\frac{Z}{TS}$ plate was almost quite clear on the face, and free from deposit, showing only a slight discolouration or tarnish, with no deposit on the varnished Z. At the top of the immersed surface was a clear band. The back of the plate was more strongly tarnished than the front, with a slight powdery deposit.

It will be seen that the results with the two developers are quite different, and may be represented by C and **Z** in the case of the plain developer, and by $\frac{\mathbf{C}}{\mathbf{TS}}$ and $\frac{\mathbf{Z}}{\mathbf{TS}}$ in the case of the developer with thio-sinamine, the black letters representing deposit, and the light ones freedom from it.

Similar results were obtained with bromide paper and gelatine dry plate films, but it may be remarked that, whereas the C plates showed with both developers a clear image of the varnished C, surrounded by more or less dense deposit (much denser and yellower with the thio-sinamine), there was a marked difference in the Z plates, that immersed in the plain developer showing a dense deposit with a clear Z, while, with the thio-sinamine developer, the Z is shown dark on a clear ground.

Ferrous oxalate does not seem to give such marked reversals—at any rate with bromide paper—as eikonogen does, and this agrees with the photographic results. With gelatine dry plate silver bromide films, it was noticed that, in the ferrous oxalate developer, the Z plates darkened first, and with the thio-carbamide the C plates blackened first and most strongly.

The developers seem to be good conductors of the electric current, and do not increase the resistance very much.

It may also be noted that pencil marks made at the back of the papers were found to be reproduced very strongly on their film side, in contact with the silver plates, and were strongest on plates treated with the thio-sinamine developer.

Having obtained these results with bromised silver plates, a further trial was made with similar plates to see if a current could be detected between an unexposed and an exposed plate without the aid of the battery, and this time with a more successful result. The plates were, as before, treated with bromine water, washed, and dried. The developer used was made up of 1 part each of eikonogen and carbonate of lithia, and 2 parts of sodium sulphite, in 100 parts of water. One plate having been exposed to a weak yellowish light, the plates were attached to the poles of the galvanometer, and the unexposed plate immersed in the developer. On dipping the exposed plate, the needle at once deflected some ten degrees, but quickly returned to zero. Another pair of plates gave the same result. A third pair immersed in the same way in some of the same developer, to which thio-sinamine and potassium bromide had been added in the proportions given above, showed a similar deflection, but the needle remained for some time at about five degrees, and only very slowly returned to zero.

It may be noted that after fixing, the exposed plate of this last experiment showed a black deposit with a dark line at the immersion edge. It showed little or no tarnish, and, in most respects, corresponded with the $\frac{\mathrm{C}}{\mathrm{TS}}$ plates of the experiments with the battery. The under-exposed plate, on the other hand, showed a very considerable yellow tarnish, stronger on the back of the plate than on its face, and no marked line at the immersion edge. Generally it corresponded with the $\frac{\mathrm{Z}}{\mathrm{TS}}$ plates of the battery experiments with the thio-sinamine developer.

The two plates used with the plain developer showed very little difference. There was deposit on both, but the exposed plate showed a light line at the immersion edge, and the unexposed one showed a black line.

On repeating the experiment, but with the plates attached to the wooden block, so that they were immersed together, it was found that, with the plain developer, no distinct current was produced on immersing the plates, or afterwards, though there seemed to be very faint indications of a current, which might be visible with a more delicate galvanometer. With the thio-sinamine developer, however, although there was no immediate deflection, the needle slowly turned in the same direction as before, to about five degrees, remaining there for some time, and then again slowly returning to zero. This action seems to correspond with the gradual change of the photographic image under the thio-carbamide developers.

On repeating this experiment with a fresh pair of plates, in fresh developer containing only one per cent. of sodium sulphite, and about 5 drops to the ounce of an alcoholic solution of Professor Reynolds' compound salt of thio-carbamide and ammonium bromide, exactly the same result was obtained.

The strong initial deflection of the needle when the plates were immersed separately appears to be due to polarity, and was noticed by Becquerel. On immersing two *unexposed* plates in the same way in plain developer, the same deflection was noticed, and very much stronger. These results cannot be taken as conclusive, and a great deal of farther investigation is necessary with other developers and thio-carbamides, as well as with other silver haloid films, used with and without the silver-plate conductors. The products formed at both poles by the electrolytic decomposition have also to be examined.

As far as the experiments go, however, they seem to show: (1) That the same kind of reversal of the deposit can be effected by a developer containing thio-sinamine, both electrically and photographically; (2) that the reversal of the photographic image on bromide of silver films by thio-carbamides is, to a great extent, if not entirely, due to electro-chemical action; (3) that the development of the photographic image on silver bromide is accompanied by electrical action.

Taken in connection with Professor Minchin's recent observations, and the earlier ones by Becquerel and others, they appear to point to the conclusion that photographic action, at any rate as regards the haloid salts of silver, is influenced by electricity, both in the action of light upon the silver haloid film, as well as in the development of the invisible image so produced, to a very much larger extent than has usually been recognised. This aspect of the theory of photography appears to have been somewhat neglected, but it seems likely that farther investigation in this direction would be rewarded with valuable results, and throw some further light on the mystery which still surrounds the formation and development of the invisible photographic image.

---

Putney Amateur Photographic Society.—Six new members were elected at the meeting on the 28th of February, when there was an exhibition of lantern slides.

Photographic Society of Great Britain.—March 24th, technical meeting; subject for discussion, "Hand-Cameras"; members are requested to bring their cameras with them. March 31st, lantern evening, and discussion on lantern matters. April 14th, Mr. W. Willis will read a paper on "Platinotype." April 28th, subject for discussion, "Animal Photography." The exhibition of collotypes will remain open till April 14th.

## THE PHOTOGRAPHIC CHART OF THE HEAVENS.

BY WILLIAM E. PLUMMER, M.A., F.R.A.S.

The proposal of Admiral Mouchez, the director of the Paris Observatory, to photograph the entire sky has been so long before the public, and so much has been written and said about it, that some hopeful persons may be under the impression that considerable strides have been made towards its accomplishment. Such sanguine persons may be surprised to learn that the scheme is not yet even commenced as a whole, but is still in its initiatory stage. The art—or, at least, the practice—of photography is now reduced to such simple and mechanical processes that it is feared this bold assertion, without any explanation, will suggest to many that astronomers are either very incompetent to the task, or very lukewarm in the undertaking. Such a suspicion would, however, be very unjust. Many difficulties and delays have supervened between the conception of the project and the putting it into execution. Possibly, if all the difficulties that have been successfully met had been present in the minds of the projectors, the scheme would never have entered the field of practical astronomy. As a matter of fact, some eighteen or twenty observatories have responded eagerly to the invitation of Admiral Mouchez: but the directors of these observatories have, in most cases, had to wait till callous and indifferent governments have voted the inevitable money grants. All have had to obtain the necessary instrumental appliances from a few competent artists, who required considerable time for the completion of the contracts. In order to ensure uniformity of action, many details have had to be settled by general conferences of all the participating astronomers, who cannot, of course, be frequently called together; but it is hoped that the next conference, summoned for this month, will be the last, for all the astronomers who have given their adhesion to the scheme will report that they are in possession of their instruments, and have made some progress in acquiring a knowledge of their peculiarities and facility in their use.

The principal optical difficulty, it goes without saying, is the construction of the lens. Photographers are so accustomed to make pictures covering wide angles that they will probably not appreciate the difficulties that opticians have encountered in the construction of a lens, which should give a sufficiently accurate field of two degrees in diameter. This is the same thing as photographing a picture of approximately six inches square at a distance of fifteen feet, and it would be thought a very poor lens that could not satisfactorily accomplish this task. But astronomers are exacting in their demands; they may not reduce the aperture of their lens (13 inches) by any "stops," and they have to submit the resulting pictures to considerable magnification, when many defects which would otherwise escape notice become apparent. It is then found that the images of stars, though perfectly round in the centre of the plate, become very elliptical near the edges. The size of the plate, it may be mentioned, is about six inches square, the focal length being about eleven feet; but to "cover" a six-inch plate is not generally thought a very severe trial in photographic manipulation.

We have said that the image of a star in the centre of the plate is round, but when seen under a microscope of moderate power the image does not present the appearance of a simple, round black disc, varying in size with the brilliancy of the star and the time of exposure, but rather exhibits itself as the condensation of many minute black points, very dense and compressed towards the centre in moderately bright stars, but towards the periphery the condensation is much less marked, and the total area covered by the star image is generally ill defined. In faint stars the condensation is scarcely noticeable; a larger or smaller number of particles of the silver salt are decomposed, but these particles are not necessarily in contact, and, therefore, complete blackness does not result. A more or less nebulous appearance, possibly a three-hundredth of an inch in diameter, therefore accompanies the images of faint stars on the negative, and, since the distance between these images has to be measured to about the ten-thousandth of an inch, it will be readily seen how important it is to procure small, hard, black discs. A peculiarity in stellar negatives, which is not yet fully explained, is the considerable spread of these images. In an ordinary telescope a faint star is a very minute point, approaching the geometrical definition, but on a sensitised film after long exposure, the size of the image is of a very measurable extent; and the rate of increase is peculiar. Allowing for some irregularities, the diameter may be said to increase as the fourth root of the time of exposure; that is to say, if, after an exposure of a minute, a star has a certain diameter, then, on the exposure being continued for sixteen minutes, it will be found that the diameter has doubled. This spread of the image may arise from two causes, either operating as an irradiation from the centre of disturbance; but whether this irradiation is produced by scattered reflection among the separate particles of bromide of silver, or is due to a species of fluorescence, or some similar property in the sensitive film, is undecided. Be that as it may, a plate after development exhibits a number of these small black discs, differing in size and intensity according to the brightness of the stars, and therefore giving, in addition to their relative positions, the photographic magnitude of the stars themselves. These negatives can be printed on either silver or bromide paper, and thus a picture of the heavens of great accuracy is always at the command of astronomers, who, to some extent, may, therefore, hope to continue their studies irrespective of clouds and bad weather, while to successive ages is secured a picture accurately representing that portion of the sky at the period at which that negative was taken.

The measurement of these plates is, however, not a simple business, for over and above the distortion likely to be introduced from the necessary imperfection of the object glass and the employment of a plane plate, there is the additional difficulty that the film, in some of the processes of developing, fixing, washing, and preserving, may shift locally on the plate itself, carrying with it the images impressed, and so giving a faulty representation of the relative positions of the stars. This difficulty has been met in an ingenious manner. On a plate—the size of those to be subsequently employed—a film of silver has been deposited, and on this film a network of lines about one-fifth of an inch distant is ruled at right-angles, in such a manner as to remove the opaque silver and leave the glass exposed. Before a plate intended to obtain a picture of the stars is exposed in the telescope, this reticulated plate is placed against the film, and, by means of parallel light, a latent picture of the reticulations is left on the sensitised surface. The silver, of course, prevents the light affecting the other parts of the film; therefore, after exposure, in developing, this network picture and the star images come up together, and if there be any local shift in the film a method of correction is supplied.

The development of a plate, also, is not without its difficulties. If there be no bright stars on the plate, and there are many spots of two degrees square on the heavens in which the eye cannot detect a single star, the growth of the picture is a matter of guesswork, and generally decided by the discolouration of the plate. It has been promised that the whole question of the preparation of the most suitable and most sensitive emulsion, as well as development and subsequent preservation of the negative, should be threshed out under the auspices of the well-known photographer, Dr. Eder. The results of the experiments, which, it is understood, have been carried on in his laboratory, have not yet been published, but are looked forward to with interest. Among other difficulties in development there is the old question of the adequate treatment of violent contrasts in light.

If you have a star of the first magnitude, and one of the sixth, you have in the former one hundred times the light in the latter, while, if the range extends through twelve magnitudes, the light of the brightest star is to that of the faintest as unity to sixty thousand. Therefore, there must be stars both violently over-exposed and under-exposed, all to be developed together, and the images often in contact. The effect of this violent contrast will be appreciated when we say that the images of the brighter stars are usually seen reversed, that is to say, the centre is white instead of black.

The manipulation and the subsequent discussion of a single plate does not seem to offer insuperable difficulties, but it must be remembered what a very small portion of the entire sky is a district of two degrees square—the portion which is represented on a single plate. On a globe there are approximately 40,000 square degrees, so that ten thousand plates will be necessary, and since—to secure accuracy, and to be certain of the elimination of untoward specks and spots on the plates which have much the appearance of stars, but are not—it is proposed to cover the whole area of the heavens *twice*, twenty thousand plates will be required. To some large photographers the manipulation of this number of plates may not seem a very extraordinary undertaking, but then it must be remembered that the exposure required for the production of each plate is much longer than anything to which they are accustomed. In order to secure impressions of the stars of the faintness thought necessary by those who are responsible for the scheme, an exposure of probably fifteen minutes for each plate will be required, while, to carry out the grand scheme in its integrity, exposures of probably not less than ninety minutes will be necessary. When it is farther remembered that these exposures can only be made at night, and when the sky is transparent, it will be admitted that astronomers are courting a sufficiently onerous task, but one which, it is hoped, they will be able to carry to a successful issue.

It is altogether premature to guess at even the number of stars which will record themselves on the sensitised films, but one thing is certain, all stars of a definite degree of brilliancy will be secured. There is no possibility of a photographic plate overlooking or neglecting to record the position of a star, though, of course, in the discussion of the plates afterwards, human infirmity may and will fail to describe all the facts recorded on the film; but the negative remains for re-examination and re-discussion, and much negative evidence is effectually excluded. The places of all the stars depicted on the plates, obtained with the shorter exposure mentioned above, it is hoped to form into a catalogue, which may possibly grow to the dimensions of a small library. But the results from the longer exposure must be left in a chart-form, from which astronomers of the future must pick out the precise facts for which they are seeking.

*Oxford University Observatory.*

## A RAPID SENSITIVE SALT FREE FROM SILVER.

Little in accordance with scientific custom is it to publish much about new results when the means of arriving thereat are kept secret for commercial or other purposes, but having the trustworthy assurance of Mr. Frederick Varley that, in the experiment which he performed at the close of Professor Meldola's lecture at the Society of Arts last Monday night, there was no silver salt in the sensitised paper or in the developer, or in any of the solutions he used, and that the materials employed were all excessively cheap, we append a few particulars.

Mr. Varley said that the process was the result of researches made by Mr. Friese Greene. Mr. Varley exposed some paper sensitised with the salt under a negative to the diffused gas-light of one of the reading lamps, in which a great amount of the light, to the extent of at least forty per cent., was cut off by having to pass through an opalescent shade and dish; under these conditions an exposure of about half a second was amply sufficient to secure a good picture full of detail in the shadows. We are informed by Mr. Varley that in some recent experiments he has made in conjunction with Mr. Greene, he has found means to render this salt four times as rapid. He says that had the exposure last Monday been made to a naked gas flame, one-fifth of a second would have been sufficient. By Mr. Varley's additional discovery, he claims that under like circumstances he could have given one-twentieth of a second. Some months back we made some mention of the discovery of this new sensitive salt, and have in our possession a print of a doll taken by its use at that time.

The Photographic Club.—March 25th, lantern night; April 1st, adjourned discussion on "Shutters." Bank Holiday outing at Leigh, near Southend.

Aluminium.—Among the uses of aluminium suggested by Mr. Eugene H. Cowles, according to *Modern Light and Heat*, are the following:—At 50 cents per pound, the new metal will compete with copper at 17 cents, the latter being 3·56 times as heavy as an equal bulk of aluminium; but the electrical conductivity of aluminium, that is, 98 per cent. pure, is only 75 per cent. that of copper, so that one-third more area would be required to do the same work. A reduction of 45 per cent. in weight of motors for electric cars can be secured by using the new metal, which in itself is no small advantage, seeing that the latter promise to come into extensive use in the near future. The coating and lasting qualities of aluminium far surpass those of tin, and it will cover three times as much surface for equal weights, making it necessary to sell tin at 16 cents per pound in competition with the other at 50. Nickel at 70 cents would no longer be used for plated ware or coinage, the new metal being much cheaper and cleaner. He expects to see it sell at 200 to 300 dollars per ton, and at these figures it will be the cheapest metal next to iron and steel. The price must fall lower and lower as the facilities increase for making the material, and the market adapts itself to the absorption of larger quantities of the new metal.

## PHOTOGRAPHIC SHUTTERS.*

BY FRANCIS BLAKE.

19. *Prosch* (*Special*) *Duplex*.—Made to order for euryscope wide-angle lenses. Time exposure, squeezing the bulb as quickly as possible, 0·211 s. Instantaneous exposure, direct compression of bulb, 0·031 s. Instantaneous exposure, released compression of bulb—1st test, 0·020 s.; 2nd test, 0·021 s. This is a most conveniently arranged shutter, as it is attached to the front-board of the camera; and carries on its front face a flange which receives any one of a set of wide-angle lenses.

Now, the results which have just been given hurriedly have probably made but little impression on the minds of most of those who are present. A few of you may have had an intelligent interest in the statement of results obtained with some particular shutters with which you are familiar; but, in general, you probably have but an indistinct memory of a lot of unintelligible figures. Nevertheless, if you had had time to carefully digest the results obtained, I feel sure that you would have reached the conclusion that the average working speed of commercial shutters is about three hundredths of a second, and that while a few of these shutters may be forced to come well within this average speed for test purposes, they are made to do so at the expense of so great a loss of light that they are of but little practical use when so forced. Three hundredths of a second is too slow a speed for photographing the quickest motions of animate or inanimate nature, and the successful pictures obtained with shutters of that speed are due to the fortunate coincidence between the moment of exposure and a slower phase of motion. Thus, with such a shutter, the most rapid phases of motion produce blurred plates, which are thrown into the waste box; and science receives but a few special—and, therefore, misleading—data in place of the many which the art of photography should be made to yield. This generalisation forced itself upon Mr. Hubbard and myself after two years of patient experimentation with every conceivable form of shutter applied before, between, or immediately behind the lens; and, at his suggestion, we then abandoned all work in that direction, and devoted ourselves to the perfection of the focal plane shutter as described in the quotation from Sutton at the beginning of this paper.

I have known of no commercial shutter which passes more than 50 per cent. of the light which falls on the lens during its action; while the focal plane shutter has been lying idle for twenty-five years, in spite of its ability to pass close on to 100 per cent. What may be called the "light advantage" of the focal plane over an ordinary shutter is well indicated by the following considerations. With any form of shutter in which a slot one inch in width passes at a uniform velocity behind a lens one inch in diameter, the sensitive plate will receive but 50 per cent. of the light which falls on the lens during the action of the shutter. Supposing the lens to be five inches in focal length; if the slot is merely moved backward to within one-quarter of an inch of the plate, 95 per cent. of the light falling on the lens during the action of the shutter will reach the plate.

Farther consideration of the subject shows that in any single shutter placed immediately before, between, or behind a lens of one-inch opening, the percentage of light passed is equal to the number of inches of slot travels less one times the units of light per inch. Thus, a one-inch slot travels two inches in uncovering and covering the lens. Calling the total light falling on the lens during the action of the shutter equal to 100 units, we have 50 units to each inch of the slot travel. Slot travel two inches minus one$=$1 inch $\times$ 50$=$50, which is the percentage of light passed. A two-inch slot would travel three inches, and there would be $33\frac{1}{3}$ units of light to each inch:—

$3-1 = 2 \times 33\frac{1}{3} = 66\frac{2}{3}$, the percentage of light passed. Continuing the computation, it will be seen that a 3-inch slot would pass 75 per cent.; a 4-inch slot 80 per cent.; and so on until, in order to pass 90 per cent. of the light, it would be necessary to have a slot nineteen inches long pass by the lens in the same time that the focal-plane slot passes over five hundredths of an inch, which is the diameter of the cone of rays from a one-inch lens of five inches focus at a point one quarter of an inch in front of the sensitive plate. Opposed to this tremendous advantage, there is only one theoretical objection to the principle of the focal-plane shutter; and that is, that all parts of the sensitive plate are not exposed at the same time. But practically this objection does not hold good, since the velocity of slot motion may be made so great that there is no sensible distension of the phase of motion of the moving object. Moreover, the possibility of any distension may be eliminated by setting up the camera at such a distance from the moving object that the angular value of its image on the sensitive plate shall be equal to, or slightly less than, the width of the shutter slot.

The focal-plane shutter which I now show you is the outcome of the experimental work carried on by Mr. Hubbard and myself during the last four years. It consists of a mahogany case attached to the back-board of a $6\frac{1}{2}$ by $8\frac{1}{2}$ camera. The case is $18\frac{1}{2}$ inches long, $9\frac{1}{2}$ inches high, and $\frac{7}{8}$ inch thick outside measurements. At its centre is an opening in which may be placed a focussing screen on a 4 by 5 plate-holder.

Within the case are two screens, $5\frac{1}{2}$ by $5\frac{3}{4}$, and $4\frac{1}{2}$ by $5\frac{3}{4}$ inches in size. They are made of a very light frame-work of bamboo covered with thin tissue paper rendered thoroughly light-proof by the application of a mixture of lamp black and shellac. These screens run freely on two brass wires strained lengthwise across the wooden case above and below the plate-holder opening.

Attached to the base of the larger screen is a piece of thin sheet steel pivoted to the corner of the base at one end, and divided on its lower edge into ten notches one-tenth of an inch apart. Attached to the opposite corner of the base of the smaller screen is a screw stud, over which the notched piece may be slipped. By this simple bit of mechanism the two screens may be, at will, attached to each other with a slot between them varying from one-tenth of an inch to one inch in width by tenths. The exposure is made while this slot is passing over the sensitive plate, motion being imparted to the screens by means of a steel pin connecting them with a wooden piston, which, in turn, is driven through a brass tube by compressed air.

With a one-tenth inch slot, in connection with a 2B Dallmeyer lens, three tests for speed of this shutter have given the following results:—

| | |
|---|---|
| 1st test ... ... ... ... ... | 0·0006 |
| 2nd ,, ... ... ... ... ... | 0·0006 |
| 3rd ,, ... ... ... ... ... | 0·0005 |
| Mean | 0·0006 |

* Continued from page 188.

This speed, which we may call half a thousandth of a second, is a severe tax upon the ability of the most rapid lenses and plates to produce pictures. It is obvious that the speed of the shutter may be increased to any desired extent by simply narrowing the width of the slot; but, until the market affords us quicker lenses or plates, there will be no practical advantage in making exposures of less than half a thousandth of a second.

The lantern slides of pigeons in flight which will now be thrown upon the screen were made from negatives taken with this shutter, using a slot two-tenths of an inch wide. The length of the exposure was, therefore, one-thousandth of a second, but you will note that the eyes and feathers of the birds are as sharp as if they had been standing still.

[Enclosed with the foregoing paper was a print from a plate recently made from one of Mr. Blake's negatives. The original negative was made during November, 1889, on a 4 by 5 Cramer 50-plate, 1,000th of a second exposure, and developed with Elliott's single solution hydrochinone developer; 3B Dallmeyer lens full opening was used. The photogravure plate was made from a negative which was taken from a positive about two diameters larger than the original, using Cramer 30-plates and pyro carbonate-soda developer for both steps of the work.—Ed. P. N.]

## THE ANTWERP INTERNATIONAL MICROSCOPIC EXHIBITION.

Dr. Henri Van Heurck sends us the prospectus of the forthcoming International Microscopic and Photomicrographic Exhibition at Antwerp, which will be open during the months of October and September next, a lengthy document, which can be had on application to the general secretary, M. Charles Van Geert, Jr., vice-president of the Floral Circle of Antwerp. The president is M. Charles de Bosschere, the vice-president Dr. Henri Van Heurck, and the other members of the executive committee are MM. Edmond Grandgaignage, Gustave Royers, and Ferdinand Van Heurck.

Two other exhibitions will be open in Antwerp at the same time, the one of vegetable products, and the other of horticultural products.

At the Microscopic Exhibition, which will take place in the Royal Athenæum at Antwerp, almost all objects directly or indirectly connected with microscopy will be received, so far as can be judged from the programme. The honorary presidents of the Exhibition are Dr. Abbe, Professor at the University of Jena; Mr. Crisp, treasurer to the Royal Microscopical Society; and M. Nachet, optician, of Paris. Honorary committees representing various nations have been formed; the English one consists of Sir J. D. Hooker, honorary director of Kew Gardens; Mr. John Mayall, Jr., secretary to the Royal Microscopical Society; Mr. Julien Deby, Dr. Maddox, Dr. Dallinger, Mr. Andrew Pringle, and Mr. A. Comber.

Prizes will be given in recognition of the best exhibits. The prizes will consist of diplomas of excellence, diplomas of honour, gold medal diplomas, silver medal diplomas, bronze medal diplomas, and diplomas of honourable mention.

Leeds Photographic Society.—On Monday evening last Mr. Godfrey Bingley, president of the Society, gave the third of a series of elementary lectures, his subject on the present occasion being "Albumen and Aristotype Printing." Prints illustrating the processes of printing dealt with were handed round.

## THE FEDERATION OF LONDON PHOTOGRAPHIC SOCIETIES.

The following circular has been sent to London and suburban photographic societies:—

11, *Leadenhall Street, London, E.C.*
*March 14th*, 1891.

Dear Sir,—I have just heard from the Photographic Society of Great Britain, kindly granting the use of a room at 50, Great Russell Street, Bloomsbury, W.C., for the meeting held there on Monday, March 2nd, and adjourned to Monday, March 23rd, at 8 p.m., and trust your society will be represented by two delegates.

Will you please fill in and return to me the enclosed form not later than Friday, March 20th.

By way of agenda paper, I append a copy of the resolutions passed at the meeting of the 2nd inst. Will you please be prepared to vote as to whether the first delegates should continue in office till the first annual meeting.—Yours truly,

Lewis M. Biden.

Agenda.

*Resolutions passed at the meeting convened by Mr. L. M. Biden, of Delegates from the London and Suburban Photographic Societies, on the 2nd March,* 1891.

1. That it is desirable to form an association or federation of societies and clubs whose members are interested in photography.

2. That the London and suburban societies be requested to send two delegates to make the necessary arrangements to settle the name and draw up the constitution of the proposed association, and to fix the terms of membership, &c., the delegates to have power to appoint a committee for this purpose, such delegates to continue to act for a period not exceeding six months from the launching of the association.

3. That the delegates take into consideration the following objects first: (*a*) The interchange of lectures, papers, lantern slides, &c.; (*b*) the obtaining the reduction of railway fares to photographers on their outings, either singly or in parties; (*c*) the admission of the various societies joining the federation as corporate members of the Photographic Society of Great Britain; (*d*) generally to promote photographic knowledge and research.

4. That the delegates be requested to prepare a list of honorary lecturers, who, when disengaged, will, without charge or fee, lecture, read papers, give demonstrations and lantern evenings before other societies, and to make rules in connection with the expenses, and otherwise.

Mr. Biden adds:—Mr. Buchau proposes to ask for secretaries to furnish prints of London photographs from all negatives in possession of their members, with a view to using them as a commencement of a survey of London.

Appended is a copy of the "enclosed form" of which Mr. Biden speaks in his letter:—

The following Members of the Photographic Society are willing to lend Lantern Slides and to Lecture without fee or payment, except expenses (limited to ) for travelling (and gas?). This is conditional on no special engagement preventing, and the lecture hall being sufficiently easy of access:—

| Name of Lecturers. | Their Private Address. | If possessing a Lantern and Screen. | Name or Subject of Lecture or Paper, and if written. | If he will only lend Slides. | Number of Lantern Slides. |
|---|---|---|---|---|---|
| | | | | | |

London and Provincial Photographic Association.—March 12th was a lantern night, and the evening was occupied with the exhibition of members' transparencies. A large number of slides was projected on the screen, contributed by Messrs. Howard, Chang, Wellington, and others. Mr. W. H. Prestwich occupied the chair.

## AMERICAN INTERNATIONAL COPYRIGHT GRANTED FOR PHOTOGRAPHS.

The following is the full text of the United States International Copyright Act, just passed, and which includes photographs:—

Be it enacted,—That section 4,952 of the Revised Statutes be, and the same is hereby amended so as to read as follows :— "Section 4,952.—The author, inventor, designer, or proprietor of any book, map, chart, dramatic or musical composition, engraving, cut, print, or photographic negative thereof, or of a painting, drawing, chromo, statue, statuary, and of models or designs intended to be perfected as works of fine arts ; and the executors, administrators, or assigns of any such person shall, upon complying with the provisions of this chapter, have the sole liberty of printing, reprinting, publishing, completing, copyiug, executing, finishing, and varying the same, and iu the case of dramatic composition, of publicly performing or representing it, or causing it to be performed or represeuted by others, and authors or their assigns shall have exclusive right to dramatise and translate any of their works for which copyright shall have been obtained under the laws of the United States."

*Section* 2.—That section 4,954 of the Revised Statues be, and the same is hereby amended so as to read as follows :— "Sectiou 4,954.—The author, inventor, or designer, if he be still living, or his widow or childreu, if he be dead, shall have the same exclusive right continued for the further term of fourteen years, upon recording the title of the work or description of the article so secured a second time, and complying with all other regulatious in regard to original copyright within six months before the expiration of the first term, and such person shall, within two months from the date of said renewal, cause a copy of the record thereof to be published in one or more newspapers printed in the United States for the space of four weeks."

*Section* 3.—That section 4,956 of the Revised Statutes of the United States be, and the same is hereby amended so that it shall read as follows :—"Section 4,956.—No persou shall be entitled unless he shall, ou or before the day of publication in this or any foreign country, deliver at the office of the Librarian of Congress, or deposit in the mail within the United States, addressed to the Librarian of Congress at Washington, district of Columbia, a printed copy of the title of the book, map, chart, dramatic or musical composition, eugraving, cut, print, photograph, or chromo, or a description of the painting, drawing, statue, statuary, or a model or design for a work of the fine arts, for which he desires a copyright, nor unless he shall also, not later than the day of the publication thereof in this or any foreign country, deliver at the office of the Librarian of Congress at Washington, district of Columbia, or deposit in the mail within the United States, addressed to the Librarian of Congress at Washington, district of Columbia, two copies of such copyright book, map, chart, dramatic or musical composition, engraving, chromo, cut, print, or photograph, or, in the case of a painting, drawing, statue, statuary, model, or design for a work of the fine arts, a photograph of same ; provided that in case of a book, photograph, chromo, or lithograph, the two copies of the same required to be delivered or deposited as above shall be printed from type set within the limits of the Uuited States, or from plates made therefrom, or from uegatives or drawings on stone made within the limits of the United States, or from transfers made therefrom. During the existence of such copyright, the importatiou iuto the United States of any book, chromo, lithograph, or photograph so copyrighted, or any edition or editions thereof, or any plates of the same not made from type set, negatives, or drawings on stoue made within the limits of the United States, shall be, and it is hereby prohibited, except iu the cases specified in paragraphs 512 to 516 inclusive in section 2 of the Act, entitled 'An Act to reduce the revenue aud equalise the duties on imports, and for other purposes,' approved October 1st, 1890 ; and except in the case of persons purchasing for use, and not for sale, who import subject to the duty thereon not more than two copies of such book at any one time ; and except in the case of newspapers and magazines not containing in whole or in part matter copyrighted under the provision of this Act, uuauthorised by the author, which are hereby exempted from prohibition of importation ; provided, nevertheless, that iu the cases of books in foreign languages of which only translations in English are copyrighted, the prohibition of importation shall apply ouly to the translation of the same, and the importatiou of the books in the original language shall be permitted."

*Section* 4.—That section 4,958 of the Revised Statutes be, and the same is hereby amended, so that it will read as follows : "Section 4,958. The Librarian of Congress shall receive from the persons to whom the services designated are rendered the following fees :—First, for recording the title or description of any copyright book or other article, 50 c. ; second, for every copy uuder seal of such record actually given to the person claiming the copyright or his assigns, 50 c. ; third, for recording and certifying an iustrument of writing for the assignment of a copyright, 1 dollar ; fourth, for every copy of au assignment, 1 dollar. All fees so received shall be paid into the Treasury of the United States, provided that the charge for recording the title or description of any article entered for copyright, the production of a person not a citizen or resident of the United States, shall be 1 dollar, to be paid, as above, into the Treasury of the United States, to defray the expenses of the list of copyright articles, as hereinafter provided for. And it is hereby made the duty of the Librarian of Congress to furnish to the Secretary of the Treasury copies of the entries of titles of all books and other articles wherein the copyright has been completed by the deposit of two copies of such book, printed from type set within the limits of the United States, iu accordance with the provisious of this Act, and by the deposit of two copies of such other article made or produced in the United States ; aud the Secretary of the Treasury is hereby directed to prepare aud print at intervals of uot more than a week catalogues of such title eutries, for distribution to the collectors of customs of the Uuited States, and to the postmasters of all post-offices receiving foreign mails, and such weekly lists as they are issued shall be furnished to all parties desiring them at a sum uot exceediug 5 dollars per annum ; and the Secretary and the Postmaster-General are hereby empowered aud required to make and enforce such rules and regulations as shall prevent the importation into the United States, except upon the couditions above specified, of all articles prohibited by this Act."

(*To be continued*).

Photographic Subjects in Polynesia.— *The Colonies and India* describes a new field for photographers, and photographs of the ruins meutioned would be of considerable interest : "Mr. H. B. Sterndale, who passed to and fro among the Pacific Islands with an observant eye a few years ago, has lately been making public the result of his researches among the Cyclopean remains to be found in various parts of the Polynescau archipelagoes. Ponapé, where the Spaniards are now busy carrying on a war of extermiuatiou against the unfortunate natives, has long been knowu to travellers in that region for its curious relics of an earlier civilisation, and evidence of the remains discovered upou the Easter Island some years ago are at the present time to be seeu in the rude statues which stand at the eutrauce to the British Museum. Mr Sterndale appears to have gone further afield, and in the island of Lele he made some interesting discoveries. Lele is situated in 98deg. south latitude, aud 160 deg. east longitude, and is described as a volcanic islaud, with an extinct volcano scarped and walled to the summit. Here is to be found a wilderuess of ruined castles, the walls in some cases 12ft. thick and from 30ft. to 40ft. in height. They are iu the form of parallelograms, 200ft. by 100ft. for the most part, but some are described as being very much larger. Many of the buildings appear to have been erected upon artificial islets, which are surrounded by canals liued with stoue. The theory put forward by Mr. Sterndale is that early Hindoos reached not only Polynesia but Central America, and he points to the use by the Polynesians of the word 'meru' for paradise, aud the word 'dewa' for spirit, as distinct evidence in support of his contention."

## Notes.

Belgian photographers, in their official organ, the *Bulletin Belge*, have expressed few or no opinions about the coming International Photographic Congress in Brussels, which, it is to be hoped, will not be held at the same time as the meeting of the British Association for the Advancement of Science, at Cardiff. At a recent meeting of the Brussels Section of the Belgian Photographic Association, the chairman, M. Alexander de Blochouse, stated that he had been to Paris to attend a meeting of the permanent committee of the Congress; that committee will soon cease its functions in Paris and move to Brussels. At the same meeting a letter from M. Declercq de Grammont was read, urging that the next Congress should recommend that every photographic lens should have engraved upon its mount the size of plate which it covers perfectly with the largest aperture, also the amount of angle included.

S. Simon, in relation to our remark last week about unicorns, the Liverpool Amateur Photographic Association, Professor Huxley, and the basilisk, is prepared to believe in the unicorns, although he has never seen one, because they are mentioned in Scripture; but he is inclined to think the statement about the basilisk to be a mistake. He may, therefore, be informed that the basilisk is also mentioned in the Old Testament under the name of the cockatrice. Pliny and other celebrated authorities describe the animal. It is a serpent born from a cock's egg, has plenty of legs and claws, and a fine long tail; on its head is a kind of crest. Its glance is so fell that when a man catches its eye the man falls down and dies; when he sees another variety of the basilisk all the flesh falls from his bones. The only living things the basilisk fears are the weazel and the cock, which is why they keep so many of the latter birds, and other poultry, at the back of the Alexandra Hotel at Liverpool. The best time for photographing the basilisk in the forests near that city is after dinner, when there is plenty of sunshine about, and when the adventurer is guided by any suitable member of the Corporation of Liverpool. Basilisk hunters carry a piece of looking-glass to catch and throw back the deadly glance of the creature, thus causing it to slay itself. It is useless, in these dangerous photographic excursions, to carry any other than a demon camera; if one of the blue demon description be employed the quest is all the more likely to be successful. Professor Lippmann might be invited to join in the next hunt to try the efficacy of his mercurial mirror. Those photographers who wish to join the next basilisk hunt have our permission to write for an invitation to Mr. Paul Lange, president of the Liverpool Amateur Photographic Association, and to enclose their portraits. Those who wish to know more about the habits of the animal should write to Mr. Bartlett, the superintendent of the Zoological Gardens, London.

A committee of one person never loses time in talk or in idle contention, but carries out all its designs promptly without let or hindrance from colleagues. Washington Irving tells of a fierce debate in Congress, in its early days, as to which department of the State fell the duty of stopping up a hole in the wall of the Parliament House, through which hole the winds of heaven blew, and gave the legislators colds in their heads. The debate had waxed hot for three nights, when a member of Congress resolved himself into a committee of one, and paid a bricklayer to stop up the hole. This brought the debate to an end. Instead of originating palavers at society meetings and in newspapers, Mr. Lewis M. Biden, of the Toynbee Camera Club—whatever and wherever that Club may be—single-handed called a meeting of delegates of London photographic societies to consider the question of the federation of such societies, which now find themselves half way to practical federation before they know much about the matter or have had time to breathe. Mr. Biden can say, with one of old, "Alone I did it." In accordance with a resolution passed at the last meeting, he has called another meeting of delegates for Monday evening next at the rooms of the Photographic Society; in his circular doing so, dated March 14th, he gives some of the resolutions passed at the last meeting, omitting the one to invite delegates from the Photographic Society to attend. The so far suggested objects of the federation seem to be of a reasonable and useful nature.

M. Janowski has been trying experiments on the action of light upon the typhus fever bacillus, and finds that it tends to kill it, no doubt by oxidation, and that the more actinic rays of the spectrum exercise most power in this respect. They tend to kill protoplasmic matter. They have the same influence over the diphtheria bacillus. Perhaps a conclusion may be drawn from this, that the dirty air of London not alone is an obstacle to the rapid taking of photographs, but promotes the disease of human beings by cutting off the supply of the most actinic rays. The intense blue colour of some Alpine flowers, a richer blue than ever seen in the lowlands, has often been speculated to be in some manner due to the rich supply of violet and ultra-violet rays which vegetation receives in those regions of pure air.

A recent action, brought by a photographer against a lady client for the price of copies of portraits supplied to her, indicates a carelessness in business arrangements which is as unfortunate as it is indefensible. According to the defendant, she was asked by the photographer, "by way of compliment," to have her portrait taken, and for this she received a few copies for herself, while the complainant "sold thousands of her photographs to the public at a very handsome profit." We presume, therefore, that the lady had attractions which gave her pictures a considerable value. At any rate, she refused to pay for the pictures, and she was supported in her contention by the Court, who gave a verdict in her favour, with full costs. It is so much against the interests of a photographer to treat his clients in this manner, to say nothing of the moral aspect of the case, that it is probable that the unfortunate dispute is due more to carelessness than anything else. Still, it is to be much regretted.

---

It has been suggested that, at public complimentary dinners, photographic portraits of the guests should be distributed at the table, not in the form of pictures mounted on card, but burnt-in by the ceramic process on the plates. Such decorated chinaware is not unknown in private houses, and we are told of one household where the cups, saucers, and plates used in the breakfast-room are so ornamented. Each member of the family is provided with his share of the table equipage bearing his own likeness, so that, as he drains his cup, he can view himself "as in a looking-glass." The idea might be extended by using the portraits of public characters, and such pictures would often stimulate conversation, which, in too many assemblies, is apt to flag.

---

It is a truth which no wise man will dispute, that most persons who quarrel with photographers for giving them portraits which are the reverse of prepossessing, should blame Dame Nature for defrauding them of those gifts which they lack, rather than the innocent owner of the camera for not reproducing that which does not exist, save in their own imaginations. Those who are deficient in perfection of personal appearance have now, we are glad to see, their remedy, and, for the cost of a few shillings, can supply what nature has denied them. They need no longer abuse the poor photographer for fancied slights, for the cure is in their own hands; at least, we presume so from what we are told in a certain advertisement which has lately appeared in one, or possibly more, of the London papers.

---

The advertisement is to the effect that an artificial nose can be supplied for 42s. (we presume that Grecian, Roman, or the tip-tilted variety can be obtained according to the taste of the purchaser). An instrument for outstanding ears—and most persons who reply to the advertisement are apt to have this disfigurement in an exaggerated form—can be had for half a guinea. Splints for crooked limbs are quoted at the same price, as are those for enlarged toe-joint. A bust improver is one guinea, a finger nail ditto 3s. 6d. Knee-caps, for increase of height, aro 7s. 6d., while, strangely enough, a leaflet code of laws for increase of stature, which seems to our unenlightened minds to be much the same thing, can be had for half a crown less. This advertisement is almost as sublime as a better-known one of American origin, which advocated the use of a cement which was warranted, among other virtues, to mend a sinner's wicked ways.

---

Dr. Gill, the Astronomer-Royal of the Cape, had an enthusiastic reception at the Royal Astronomical Society, when he gave an interesting *resumé* of the stellar photographic work which has been carried on at the Cape Observatory. While Dr. Gill says that he makes no claim to have initiated the idea of applying photography to stellar astronomy, an idea which has its latest outcome in the elaborate chart of the heavens, in the preparation of which so many astronomers are now engaged, he says that his photographs of the comet of 1882 first directed the attention of Admiral Mouchez, and that of the brothers Henry, to the application of photography to star charting. This photograph, which was secured with the assistance of a local photographer, who lent the astronomer a camera, bids fair to become an historical one, for it was taken under peculiar circumstances, the comet being plainly visible, although the sun was shining.

---

It is well known that photo-micrographs frequently give an erroneous rendering of the different tints seen on delicate and transparent objects in the microscope. When this erroneous rendering is supplemented by the artificial contrasts due to chemical intensification of the original negatives, or to the after-processes of copying and enlarging, it becomes of the first importance, in cases where photographs are brought forward in illustration of certain points, that either the original negatives, or reproductions of them as exact as possible, should be exhibited. When, says Mr. Mayall, as in many cases—notably by Dr. Van Heurck—enlarged photographs are brought forward without any precise description of the process of their production, and without the original photo-micrographs for comparison, useful criticism is difficult, if not impossible. The moral of this clearly is, that all microscopists should be skilled photographers, because, unless they are able to distinguish between negatives, of what use is the exhibition of the original negative and the enlargement therefrom?

---

A retired actress of Louisville has taken to photography, and also advertises her proficiency in the art of "making-up"; in other words, she undertakes to instruct ambitious amateurs how to transform their ordinary countenances into those of the characters which they wish to impersonate. This combination of photography with "making-up" suggests the desirability of having a skilled person attached to the studio who will prepare the face of a sitter for being photographed, so as to save the subsequent labour of retouching. If faces have to be improved, it would surely be more sensible to put in the improvement before rather than after being photographed, because, as every artist who has to make use of photographs knows, the retoucher frequently destroys every essential line which makes up the character of a face. Now, if it were possible to make up the face photographically, so to speak, the sitter would be flattered without having the individuality destroyed. It is a subject, of course, which requires some study, and not a little will depend upon the quantity and nature of the colours employed by the retoucher of the living subject.

## PHOTOGRAPHIC CHEMISTRY.

### II.

Last Monday night Professor Meldola delivered the second of his three lectures at the Society of Arts, under the presidency of Mr. Francis Cobb. There was a large attendance.

Professor Meldola said that the existence of sub-salts of the silver haloids has not yet been conclusively demonstrated, and he gave a list of the chief researches of the past in relation to this subject, including some by a British Association committee. By analogy, he said, it seems improbable that sub-salts of silver would be highly coloured, and the products obtained by those who sought to make them by reduction have all been highly coloured. It has been suggested that these products contain oxygen, and, in fact, the whole matter requires additional careful and minute study.

If silver foil be placed in cupric chloride, during the process of chlorination films of brilliant colours are formed, and a study of these films may throw light upon the phenomena of heliochromy: many of the colours are optical and not pigmental. All the heliochromic results obtained, from those of Seebeck down to those of Lippmann, he thought to be dependent more or less upon thin films, which yield colours by the interference of light. The lecturer next spoke of the coloured products obtained by Carey Lea, and produced one of them by experiment; he added that no complete analysis of such products has yet been made, and that it is not known whether they do not contain traces of some impurity, such, for instance, as iron. It must also be remembered that silver haloids have a tendency to carry down with them traces of other metallic salts.

The combinations of silver and its salts with organic compounds should be investigated by the student, and attention should be given to the chemical technology of the colloids, especially albumen, collodion, and gelatine. Albumen acts somewhat like an acid; on adding nitrate of silver to it, the so-called albuminate of silver is precipitated; if the surplus nitrate be then washed out, and the white deposit exposed to light, it darkens. Gelatine has a tendency to combine with silver, and gelatine treated with nitrate of silver will darken in the light. He then dealt with the subject of emulsions, and made a gelatino-bromide of silver emulsion.

Another thing which the photographic student should investigate is the chemistry of all the metals in any way connected with photography, also the action upon them of reducing agents; such study is likely to bring out facts of practical value, and to throw light upon the nature of the latent image. The action of light upon selenium is interesting; the action is of a purely physical and not chemical character. So also is it with a saturated solution of sulphur in bisulphide of carbon; when this solution is exposed to the light of the sun the crystallised form of sulphur separates, but there has been no chemical decomposition. It is the same with the action of light on silver iodide. If a piece of silvered glass be exposed to the vapour of iodine and then be exposed to light, it becomes yellower and more opaque, simply because of change in physical structure.* Some change takes place in the structure of the crystallised silver iodide under the action of light, for it then all falls to powder. Red cinnabar undergoes physical change beneath the action of light, and many organic compounds undergo polymerisation when light falls upon them.

The action of light upon asphalt is interesting, but whether it is a case of photo-chemical oxidation or of polymerisation is doubtful; the insoluble form of asphalt produced changes to the soluble form again by fusing. Alcohol and ether will take up portions of asphalt; the insoluble residue remaining is the portion which is most sensitive to light. Most samples of asphalt contain sulphur, but the sensitiveness to light does not depend thereupon, for samples are sensitive which contain no sulphur. Asphalt consists of a complicated mixture of hydrocarbons, and it would be well to make farther experiments in the attempt to separate the most sensitive constituent.

There are numerous cases in which light sets up actual chemical decomposition. A two or three per cent. solution of ferric chloride may be mixed with oxalic acid, and exposed to light; a little alcohol in the solution acts as an accelerator. Reduction takes place, and carbonic acid gas is given off, in the luminous rays, and the presence of the ferrous oxalate formed in the solution may be proved by the ferricyanide of potassium test. The carbonic acid given off is due to the oxidation of the oxalic acid.

Professor Meldola then dealt with production of blue prints. He added that when a common blue print is treated with a solution of an alkali, such, for instance, as caustic potash, the Turnbull's blue is decomposed, and an oxide of iron print is left; then it becomes possible to play upon this oxide of iron with other reagents. If the yellow print be well washed, then be placed in a solution of gallic acid, a black print in common writing ink results. Or the oxide of iron print may be placed in a solution of some colouring matter with which the oxide combines, such, for instance, as alizarine; in fact, there is scarcely any limit to the variety of coloured prints obtainable on these principles.

The reduction of uranic salts should be studied by the learner in the same way. The photo-chemical reduction of chromates in the presence of organic matter should be examined by him, as well as the photo-chemical relations of mercury and copper. Mercurous iodide, a greenish yellow substance, is rapidly decomposed by light, and the nature of the chemical change is known. Dr. Eder once employed a mixture of solutions of ammonium oxalate and corrosive sublimate (mercuric oxide) to form a solution as transparent and colourless as water when the proportions are properly adjusted, and this liquid, when placed in the light, at once begins to precipitate the white and insoluble mercurous chloride, which can afterwards be separated and weighed to obtain photometric results. Cuprous chloride is exceedingly sensitive to light. Indeed, photography with silver salts may be but a passing phase in the history of the art, to be superseded by the employment of other materials. He had pleasure in introducing to his hearers Mr. Varley, who would show them an important departure in the way of cheapening photographic processes; he could not reveal the nature of the materials used in relation to a discovery which had not yet passed through the Patent Office, but Mr. Varley had assured him that no silver salt was used in any part of the process.

Mr. Frederick Varley then exhibited a piece of paper of about carte-de-visite size, with a good portrait in black-

* Carey Lea proved that a developable image can be impressed upon pure iodide of silver, and that if the image be not developed it will gradually die out, and leave the plate ready for another exposure. This is one of the facts made use of by those who hold the dynamical as opposed to the chemical hypothesis of the invisible image.—Ed.

and-white on both sides of it, to show that although the salt used was very sensitive, both sides of a sheet of paper could be printed upon, each exposure not being sufficiently long to set up fogging action through the paper. He next exposed a piece of sensitised paper under a negative to weak gaslight for about half a second, as described in another column, developed it with ferrous oxalate, washed it, and exhibited it unfixed to the chairman and others present. He said that the hour being late, he would not detain them while he fixed it, but that the unfixed image would go on slowly darkening. Mr. Friese Greene had discovered the sensitive salt, and he (Mr. Varley) had found out last Saturday how to accelerate its already great sensitiveness. The process was expected to be useful for book illustration.

## THE SCIENCE OF COLOUR.

LAST Friday, at the Society of Arts, Captain W. de W. Abney delivered the last of his five lectures on "The Science of Colour," and dealt chiefly with the subject of colour-blindness. He said that out of every hundred men in the streets between four and five, on an average, were colour-blind, wanting absolutely the power of seeing either green or red. The green-colour-blind man sees everything purplish, and lives as if in a world of perpetual sunset; the red-colour-blind man sees the world as if through blue spectacles. To a green-colour-blind man emerald green looks grey, and to the red-colour-blind man blue appears white.

Here, then, we have two large classes of people going about in the world with totally different ideas of colour to ourselves, and yet we never seem to come across one of them. Why is this? Perhaps one reason is, that when we have a defect we seem to try to hide it; some people, again, do not know that they are colour-blind, until at last they discover it by accident. Colour-blindness is hereditary; but, like the gout, it usually skips one generation, and passes from the grandfather to the grandson. Among women not more than two per cent. are colour-blind; why this is so is not known. Colour-blind people cannot see so long in the twilight as we can.

Colour-blindness is sometimes induced by disease, also by smoking tobacco; in the latter case the tobacco must be strong and plentifully used; the individual also is usually in a state of mental suffering, such as that due to family bereavement. The colour-blindness then usually affects a part only of the eye, at and near the "yellow spot"; outside that region the vision is normal. To detect colour-blindness in such cases coloured peas are employed, and the individual has to gaze straight at them. He can make true selections from larger coloured objects, such as skeins of silk.

The importance of the application of tests for colour-blindness to engine drivers and naval officers and men is obvious.

The Chairman, Mr. Francis Cobb, proposed a vote of thanks to Captain Abney for his lectures, and pointed out that some of the illustrations were quite new, and had never been made public before, especially the method of mathematically registering colours so that any particular colour could be exactly reproduced after the lapse of ages.

The vote of thanks was accorded with acclamation.

THE LIVERPOOL INTERNATIONAL PHOTOGRAPHIC EXHIBITION.—Optical lantern demonstrations. To-night, 20th March, Mr. A. R. Dresser, "'Hand-Camera' Slides"; Mr. Christopher Naylor, 8.30 p.m., "A Tour Round the World." To-morrow, Mr. Paul Lange, 8 p.m., "The Wonders of Iceland," with personal adventures, and embracing one hundred photographs; Mr. Fred. Clibborn, "Up and Down North Holland," illustrated by one hundred and twenty lime-light lantern slides taken by Mr. G. E. Thompson. A promenade concert every evening, 7 till 8, and two lantern demonstrations every evening, 8 till 9.30. A promenade concert every afternoon; Miss Emilie Scott on Errard's grand piano at 3 o'clock. Mr. J. Busfield's band at 4 o'clock.

## PICTORIAL COMPOSITION.*

BY P. H. NEWMAN.

To feel the force of this principle still more we must turn to Division A, of Example 1, of the same plate. All the figures, horses, and trees might be found in nature exactly as they are here placed; but when so found they are ill-adapted to pictorial representation, and if so represented they impede the imagination in its efforts to realise the scene, in consequence of the following defects in their composition: The heads of the two horses in the foreground are exacly level with each other; the back of one slopes towards the right, the other equally to the left. The heads of the three figures are equidistant, and repeat the line of rising ground beyond them, and this, again, is repeated by the line of shadow behind the figures. The trees on the hill are exactly over the heads of the figures, and although they differ in intensity of colour and in size as compared with the figures, they hardly appear more distant; indeed, if the space between them and the heads of the figures be for a moment hidden, they will appear as if actually resting on them. The falcon, which has just taken flight after the heron, is represented at the moment when he is crossing the line of the hill, and the heron is perpendicularly over the head of the lady. Such an arrangement of objects, though aided in light, shade, and colour by the united efforts of the most distinguished painters the world ever saw, would yet fail to express space in the same degree as it is expressed in Division B of this example. In the latter, every error enumerated has been avoided, the flat surface is now lost sight of, and it is impossible to receive from this example that impression of flatness which we cannot escape in the other.

The observations concerning the objects not being level with each other are not confined to their several heights; they equally apply to the inequality of their bases; and although here the differences of level cannot be so great, yet there must be a difference, since, however small, the idea of flatness is thus destroyed, and that of space suggested. Proof of this is found in Plate XI., especially in Example 4, where, because these facts have been observed with regard to the placing of the feet of the horses on the road, and the roots of the trees on the right, we are sensible of the expression of space.

Harding makes some important strictures on some of the old masters, especially Claude, who is unquestionably a great defaulter in points of composition; and in a footnote it should be remarked that Turner is mentioned as (at the time Harding writes) having produced works better calculated than any modern pictures to be of use to students and amateurs in art.

"Nature," says Harding, "has given to all objects specific forms, and, although they may be found, 'in sportive mood,' occasionally to take each other's shapes, yet their difference in all other respects is so manifest that we can rarely confound them with the objects whose form they for a moment assume, and consequently the mind never loses a distinct conception of whatever distinguishes the one from the other. But how widely do circumstances differ when nature is represented by art! What are all objects then? What, then, are clouds, trees, rocks, mountains, figures, &c., &c.? Paint. Art in this respect makes all things alike, and is unable, except in the remotest degree, to imitate the nature of things; it is sameness all; and this defect would be fatal, and even insuperable, but for the power the artist has over his composition and the forms of his objects. So far, then, is the repitition of forms from being an advantage, that, on the contrary, their marked difference is his sheet anchor; for, seeing that with him everything is reduced to paint, and that this, of necessity, tends to confuse the mind by presenting to it every variety of nature by the same material, he relies solely on his control over the variety and distinct differences of forms at once to impress the mind with clear and distinct ideas."

Harding, you will remark, says "paint." If these precautions of composition are so vitally necessary where the artist has the advantages of polychrome to assist his effects, how much more are they demanded in dealing with black and white, or monochrome, and how supremely necessary for the photographer to take every advantage of accidents of position,

* Continued from page 204.

seeing he cannot shift anything, and be an absolute master of pictorial composition besides, to obtain the most desirable point of view, before he ventures to take his picture; and, as this necessity grows upon him in his progress in art, how few are the pictures he finds really worth taking, and how eclectic he becomes. It will need all his determination and powers of mind not to be discouraged, as in the nature of things, with the practical limitations of photography. He must not be discouraged, however, and need not be, if he is content to exercise great patience, and profit by every scrap of study he can get outside the dark room, or that darker place, the gloomy valley of artistic suicide, where, casting all else to the winds, he throws himself on the bosom of nature.

I now show two views from Harding in confirmation of the disadvantages of repetition of line in landscape – Plate XIII., 1 and 2. His comments on these are, it is needless to say, relative to modifications in treatment by the painter (shown in Example 2). They, however, serve a useful purpose to the photographer if they demonstrate the dangers and pitfalls he is constantly having put in his way, and exercise his mental powers of how best to obviate these dangers in the field. Harding goes on to say, however, that "it requires all the vigilance of keen and long-tutored observation to detect the identity of line in things dissimilar which is perpetually insinuating itself unobserved into the different forms depicted by the painter, to the consequent loss of the proper influence of every object wherever it happens to be, and sometimes to the production of results which are even ridiculous."

For a still stronger confirmation of the principle that one object or one feature of interest must not be placed perpendicularly over or under another, Harding refers the student to the next illustration, Plate XIV. As it is a view from nature, and composed of objects whose forms would be readily recognised by those who know, they must, therefore, be strictly true in kind and relation. Not so, however, the figures, except in costume. These are left to the will of the artist, and we can now examine how far the observance of this principle operates to assist him. Take first the leading features, those which come against the sky and strike at the first glance; the church and the two turrets right and left of it, seen over the roofs of the houses, and also the most prominent gables.

If the eye be allowed to travel down the surface of the picture, it will be found there is no object of remarkable interest under any of them, and that the figures themselves have also been thus arranged in relation to each other, as, for instance, the man and the cart in the distance are placed over the space between the heads of the centre group of figures in the foreground. It will also be observed that this, the principal group, is made to occupy precisely that portion of the scene which of itself—that is, without aid from extraneous features—would possess no interest; for if a slip were cut out between AA and BB, no object of importance would be removed. Hence, then, this is unquestionably the proper and only place for the principal group.

It will also be perceived that these figures are so placed that neither their heads nor their feet are on a level, for what has been said of the principal features is equally true of the subordinate, equally applicable, and attended with a like result—the expression of space. It will also be found that these groups, like all the other features constituting the pictorial beauty of the scene, are of different forms and quality. Now, if these principles be true, it should be difficult to make any change in contravention of them without damage by removing any of the figures or objects; or when applying them, to discover if the composition be perfect or not; then it should be impossible that any change in conformity with them should not make the picture better. Let the student try, for he is not to take these things on trust; conviction of their truth and utility must come from reason and experience.

There is no need to follow Harding in his further illustrations on this subject of composition. Much is, of course, applicable mainly to the painter, but I think most people who have any artistic sympathies will agree with him in some of his concluding paragraphs. He says: "Beauty in pictorial composition is as superior to individual beauty as a beautiful structure is to any of its parts. The richest collection of materials amount to little more than a confused and useless heap unless arranged in graceful order." And again: "Composition is of the highest importance to the artist as the field for the exercise of his talents in combining and arranging his objects so that each may derive an additional charm by association not belonging to it separately. With all this he must include considerations of the light and shade and colour; for whilst he assigns to each object its proper place to develop a beauty arising from one form operating on another, whilst he places the large in opposition to the small, the dignified against the humble, the near opposed to the remote, the flexible against the rigid, lines suggesting motion and others tranquility, and the perpendicular against the horizontal, he obtains but a part of the beauty derivable from composition if he fail to anticipate and prepare for those effects which he must derive from the aid of light and shade and colour."

In treating of light and shade, Harding says: "In painting the compound termed light and shade—the 'chiaroscuro' of those who prefer a foreign technical term to one supplied by their own language—simply means, when used in reference to an individual object, that relative degree of light and darkness in the colour or colours which causes it to assume the appearance of having the same external qualities of form that it naturally presents to the eye. When used with reference to a group, or groups of objects, it means their comparative lightness or darkness in relation to the whole picture; and in this, again, the light is said to be well managed where all the parts, having their proper degree of relief, contribute to the production of a good general result."

I propose to show two or three of his illustrations in reference to this subject, and, without wearying you with his long treatise of general principles, quote only his comments on these pictures, which, however, speak for themselves. Every picture produces a different impression upon us from the difference of light and shade, or what is called its "effect," as well as from the difference of subject. All kinds of effects are not suited to every kind of subject; and of the various ways in which the light and shade may be thrown or distributed at the will of the painter, some effects are, or rather must be, better than others. Let the student examine Plates XX., XXI., and XXII., and he will find that they are precisely the same in composition, alike in manipulation, alike in everything but the light and shade. The difference of their effect upon us arises from neglecting or observing an important principle.

Plate XXI. differs in sentiment from Plate XX., as well as in light and shade; and it is a question to be decided by our own feelings whether the repose of evening be more agreeable than sunshine and showers. In each the several important features are displayed with nearly equal effect.

In Plate XXI. the principal object, the castle, arrests the attention at once, in consequence of it being strongly contrasted with the sky; and although we are here more sensible of its picturesque contour, we yet lose much of the variety of its different parts in uniform obscurity. On the whole, there is not the same amount of space expressed, because the objects do not generally separate by alternate light and shade, as in Plate XXII., and the trees on the right do not detach from the sky. The monotony which prevails throughout the light and shade would not, however, be felt in colour.

There can be no doubt that, of all the three, Plate XXII. is the least satisfactory, and this is clearly owing to the disregard of placing the most conspicuous object in light. The principal light is on an uninteresting and unimportant feature, namely, on the hill on which the castle stands; and thus, as there is a light immediately behind the group of trees in the centre of the picture, our attention is drawn to them as well as to the castle, the picturesque form of which is all that we see in feeble contrast with the sky. Thus the castle, though of primary importance—for without it the subject has little or no interest—is all but lost sight of in the rivalry of what is insignificant. Nor is this all. The light on the water is immediately under the light on the castle hill, and the light on the rock is also under the light in the sky, and the bridge is nearly extinguished. The whole picture wants space and concentration of interest;

and the subject, though good, is reduced in its effect to the level of the commonplace. The value of the principles enforced is here shown by the consequence of their infringement.

Were light and shade only a matter of feeling, as is frequently insisted on, and dependent on the caprice of the painter, there is no reason why the feeling should not have suggested just such light and shade as is here given, the faults of which, be it observed, would be less easily detected in combination with pleasing colour. But are the feelings satisfied with what is done, or can the undirected feelings suggest a change for the better? Is there anything to assure their being nearer the truth in the second effort than in the first?

(*To be continued.*)

## PHOTOGRAPHY AT THE ROYAL METEOROLOGICAL SOCIETY.

LAST Wednesday night the annual exhibition of the Royal Meteorological Society of photographs, photographic apparatus, rain gauges, and apparatus relating to meteorology, was held at the Institution of Civil Engineers, Great George Street, Westminster.

In the early part of the evening a meeting took place under the presidency of Dr. C. T. Williams, M.A., in the large theatre of the Institution, and Mr. A. W. Clayden, M.A., projected various meteorological lantern pictures upon the screen. He said that last year the British Association had appointed a committee on meteorological photography, of which committee Mr. G. J. Symons was president, and he was secretary; and the committee had issued instructions to those of the public who knew anything about photography how to take pictures likely to be of use to meteorologists. He thought that their Society should exert itself to develop the popular side of meteorology, and try to remove the prevailing impression that it is an excessively dry subject. Photography can do much in this direction, and, at the coming meeting of the British Association at Cardiff, he hoped that the Society would help the committee to show a considerable collection of photographs of meteorological phenomena. The committee wanted photographs from everyone who knew how to use a camera, and the lantern pictures he was about to exhibit would illustrate some of the kind of photographs required.

Mr. Clayden then projected upon the screen a series of interesting pictures of clouds; in one of them the clouds were hanging downwards in the air like festoons. In taking these cloud pictures, he had employed a mirror of black glass placed at an angle in front of the lens; each photograph was an image of the cloud as reflected by the surface of the black glass into the lens. By this device, when light, stratified clouds were just visible against a bright blue sky, he had been able so to differentiate them that the sky came out dark behind the white cloud. He had obtained photographs by this method which he had been totally unable to get in any other way. When he first announced the method, he believed himself to be its discoverer, but afterward found that it had been previously described by Professor A. Riggenbach, of Santis Observatory, Switzerland. Perhaps he had previously read the account and forgotten it, or, perhaps, by what Dr. Carpenter called "unconscious cerebration," Dr. Riggenbach's thoughts found their way again into the world through his head.

We may here remark that this plan of using a black reflecting mirror may be of use sometimes in photographing difficult, brightly illuminated objects other than clouds. Dr. Riggenbach thinks that the polarising of the light has something to do with the result, but Mr. Clayden finds that as good results are obtained at other than the best polarising angle.

We suppose it to be possible that the front surface of the black glass exercises some kind of selective absorption to bring about the result, and that it might be well to try experimentally what photographic results are obtainable by the use of reflections from various coloured glasses well polished. By the use of black glass Mr. Clayden photographed a part of a solar halo invisible in the heavens to the eye, but visible by reflection from the surface of the glass. The mirror used was a finely ground piece of patent plate, blackened on the rough side.

Mr. Clayden projected various photographs relating to other meteorological phenomena, one of them exemplifying how hoar-frost attached itself more to the thorns of a briar than to other parts, a phenomenon, he said, which he believes has not yet found an explanation.

At the close of Mr. Clayden's lantern picture display, the company adjourned to the exhibition and inspected the contents thereof. An interesting picture, photographically and historically, was one of the Tower of the Winds, at Athens. Mr. Clayden's cameras and black reflectors were among the objects on view.

## HOSPITAL PHOTOGRAPHY.*

THE photographic rooms of Bellevue Hospital are on the top floor of the cook house. They have been there ever since the department was established. They are incommodious, out of the way, and insufficient, to say nothing of being decidedly dingy and unsavoury. New rooms are now being fitted up on the top floor of the main hospital building, which will be bright, airy, and commodious. You enter Mr. Mason's rooms through a dark passage. You find yourself in a long rectangular room, with skylights in the roof, and a camera upon the floor facing a photographer's chair placed in front of lead-coloured screens. It would look like any photographer's gallery if it were not that two sides of the room are lined to the ceiling with shelves upon which are ranged innumerable books, all bearing upon the sciences of optics and photography. You also see numerous big record books, a table covered with experimental paraphernalia, several large microscopes under cases, a number of instruments not commonly seen in photographic galleries, and no end of dust. You find nobody in this room, and you pass on to the next. This is long and narrow, with several windows. There are any number of shelves on both sides, which hold a great quantity of boxes containing negatives and other material commonly seen in a photographic establishment. On one of the walls, near the ceiling, is a series of fine large photographs of the moon in its various phases, and elsewhere are seen other photographs of a scientific nature. On wide shelves outside the windows, which have a south exposure, are a number of printing frames, exposed to the rays of the afternoon sun. There happens to be nobody in this room either, but presently the door opens from the dark room at one end of it, and an elderly man appears with a wet negative in his hand. He holds the negative up before a window, examines it critically, nods approvingly, and stands it in a drying frame. The negative represents a man of enormous proportions, photographed nearly naked. His legs appear in the picture nearly the size of an average man's waist, and his feet are almost as shapeless as those of the elephant in the circus.

"A very interesting case," says the elderly man, nodding in a gratified manner to the visitor. "A case of elephantiasis which involves several unusual features. The negative is first-class, and I have hopes that it will yield photographs which will lead to investigations for the cure of the disease which have never before been attempted. Do you know anything

* Concluded from page 104.

about medicine? If you do I can point out to you just what these new features are."

The elderly man looks both healthy and happy. He is of medium height and well built. He is fairly stout. He has hair and beard which are whiter than iron grey, notwithstanding that he is only fifty-four years old. He has a square face, a high, expansive forehead, and clear, direct, and good-humoured eyes. He impresses you at once as a man of parts, as the phrase goes, a man born a student. By the time you have talked to him five minutes you are also certain that he is a man of poetic temperament and an idealist. He has thrown off his coat, and put on a white apron which covers him from neck to toes. He wears a black silk skull cap on the back of his head, but not to cover any baldness. He receives you courteously but cautiously. He is not immediately communicative. He wants to know who you are, and what your errand is. He is Photographer Mason.

If you are curious about the department, he shows you everything with the utmost freedom. There is nothing to be concealed. He opens his library to you, all except the case which is covered with muslin and contains gems not consulted except on special occasions. He shows you his collection of expensive lenses, and explains the scientific speciality of each. He explains the mechanism of the many photographic devices which he has invented but never patented. He tells you, with a little pardonable vanity, that he has been the secretary of the American Institute for twenty-three years, the secretary of the American Microscopical Society for fifteen years, and belongs to several other scientific societies.

Then he explains the system upon which he conducts the photographic work of the department. He is not willing to take all the pictures he is asked to, because experience proved many years ago that his time would be so taken up with photographing the first surgical cases of very young hospital surgeons and other work of a purely personal sort, that the serious and valuable work of the hospital would be practically shut out. So Mr. Mason refuses to photograph any patient or operation except upon the presentation of an order, signed by the visiting physician or surgeon, and by the warden. This insures him that no unnecessary work will be required of him. The necessary work, however, takes up most of his time. If you appeared very much interested in his rooms and work, and the photographer has a half-hour at his disposal, he will bring out his scrap-books, and show you the sort of work he does. You will not care to spend much time over the scrap-books, for the photographs, though finely executed and clear in detail, are very far from attractive to the eyes of unenthusiastic laymen. They depict disease and deformity of every character, and surgical operations showing an array of ugly-looking knives and saws and other instruments. But you notice that where a picture of a diseased or deformed person has been taken, there is almost sure to appear also the photograph of the same person as cured or operated upon. Perhaps there will be several intermediate views. You also notice that Mr. Mason's interest in his work is not only that of the photographer. He knows all about the cases in their medical or surgical aspects, and he calls the minute nerves, blood vessels, and muscles of the body by their correct names.

Mr. Mason goes to his library and shows you a number of bulky books on special departments of anatomy and physiology written by noted doctors, and illustrated by himself. One large and very handsome work in several volumes he is especially proud of. It is the famous "Topographical Anatomy of the Brain," by Dr. John C. Dalton. In his preface, Dr. Dalton thanks "Mr. O. G. Mason, photographer to the Bellevue Hospital, New York, by whom all the original negatives were taken, and without whose persevering skill and technical resources it would have been impossible to overcome the difficulties of the situation."

"This," says Mr. Mason, fingering the book lovingly, "is the first copy issued. Dr. Dalton promised me I should have the very first one from the binders. He and I worked on this book day and night for over two years."

Mr. Mason got no other reward for his work than the pleasure he took in helping so effectively in its production. He replaces it on the shelves, and, as he does so, glances proudly over his big library, and says that even in Washington there is not another such a collection. He has frequently been called upon by the courts to furnish volumes in evidence in cases involving photographic technicalities. He always willingly lent his books until once he failed to get his treasure back. Since then he has photographed pages in books which the courts needed, but has never allowed a volume to go from his library. In the library you see a number of volumes on microscopy. Mr. Mason answers your questions by saying that he has made a specialty of applying photographic processes to microscopy, and is regarded as an authority in this branch in the Microscopic Society, of which he is secretary. When you ask about those photographs of the moon, Mr. Mason says he has done a great deal in the way of hitching cameras and telescopes together, too. The moon photographs he made in the Rutherfurd Observatory in 1865, when that distinguished scientific experimentalist and lawyer, Lewis M. Rutherfurd, was pursuing his personal studies of the moon. Mr. Mason explains that he eked out his scanty income considerably, a few years ago, by his scientific photography applied to publications, but that the hospital work had grown so of late that he was compelled to almost abandon this outside work.

"But why," you ask, "are you satisfied to work for nothing, when with your reputation, your skill, and your photographic outfit, you could make a great deal of money?"

"There is something better in this world, young man," says Mr. Mason, smiling, "than the accumulation of money. If I were to bend my energies to making money out of my profession, I would have little time to do the work, which, in such a place as this, tells strongly in the interests of humanity, and for the advancement of science. The work that pays is not the work that discovers, and applies, and originates. At least, that is so of my profession. I get my pay in feeling that I am doing something every day which will live after me. It is nothing to me that I make no name at my work, or that such of my accomplishments as live after me are thrown into the common lot of human advancement without attaching honour to my name. My object in living is not reputation or money, but accomplishment. It is enough for me to know that the world and science are better off because I have lived, and if it is necessary for me to forego money and live very simply to accomplish my object, why, I do so willingly."

"But how is it that you refuse to accept salaries for the very work that you are now doing? I understand that not long ago you refused a salary of 2,000 dollars."

"That is so," says Mr. Mason, "and I'll tell you just how it is. You know yourself how this city is run, and what a scramble there is for offices with salaries attached. You also know as well as I do that if 2,000 or 1,000 dollars, or even less, were paid for this work, that I would be hustled out of the place inside of a year. I've not the slightest doubt that if it were proposed to put me out, the whole hospital would protest, for I have scores of friends among the physicians and surgeons here, and have beside very many influential friends in city practice, with whom I have worked, who would also protest. But what difference would all that make? There are very many big political officials in this town who have friends to oblige with places, and, though the protests of the doctors might hold for a time, I would eventually have to go. Now I do not want to go. I feel that right here I have such an opportunity at my command to benefit humanity and help along the cause of science as I could find nowhere else. I am sure I am accomplishing something here, and I propose to stay here. I very early realised that, in order to keep my grip upon my opportunities, I would have to work for nothing, and so, from the first, I rejected all offers of payment. Twenty-three years ago my attention was called to the chances of inaugurating a great work in connection with Bellevue Hospital which had never been done elsewhere. I had previously been called up to photograph hospital cases, and I had worked very harmoniously with the physicians and surgeons at that time in charge of the hospital. Finally, the Commissioners asked me to accept the honorary title of Photographer to Bellevue Hospital. I considered it. I wanted to know just what rank that meant, and, finally, took the honorary title with the understanding that the city was to furnish me a room, and pay for the chemicals used, and that I was not to be a servant of the hospital, but to rank even with the visiting physicians and surgeons, and be responsible directly to the Commissioners. I at that time agreed to give my services, and specified that I should receive no compensation. Even then I saw the necessity of keeping this very important department entirely out of politics. From that time on, the whole object of my life has been to render the first department of hospital photography in the world perfect. What success I have had, and how I have been of benefit to the world, it is unnecessary to say, but I have been satisfied myself with my sacrifice.

"Well, some eighteen or twenty years ago I suggested to the Commissioners that I should also photograph the faces of the unidentified dead in the Morgue, in the hope that these records would lead to identification. They accepted the proposition gladly, and at that time urged me to take a salary for my work. I refused the salary; but a few years later the Commissioners again insisted upon my accepting compensation. They urged me so that I could scarcely resist, and at length, as a compromise, I suggested that I should receive 5 dollars each for the Morgue pictures, and still continue to do the hospital work for nothing. This was accepted, and I have been working since on those terms. I only make 400 or 500 dollars a year out of the Morgue work, and that is too little to tempt any one to take my whole job away from me. My position is further strengthened by the fact that the hospital work requires the use of a great many very fine and costly instruments, and that the city does not own a single one of the hospital stock. I have bought and paid for them all myself, and, in order to substitute another in my place, the city would have to make a considerable outlay, or else compel the other man to buy the stock himself—something that he probably would not care to do. My lenses are all of the finest and most expensive quality made, and were bought with the special peculiarities of the Bellevue work in view. I used to do considerable outside work purely of a scientific character, but the hospital work is so increased now that I have little time left for it. I won't do outside gallery work. I dislike to spend my time upon work which has no permanent value."

It takes some time to induce Mr. Mason to say anything of his history before he settled down over the cook room of the Bellevue Hospital twenty-two years ago. Finally, he says that he was born in Vermont, and was educated at Le Molle Institute, at Johnstown. He studied optics, and was among the first to take up the Daguerreotyping process. When the ambrotype was invented he bought out a share of the patent and opened a studio at Springfield. He made money and reputation, and finally was induced to come to New York by the then famous firm of Meade Brothers. He sold out his establishment at Springfield. Shortly afterward a review that he wrote about the then newly-discovered photo-lithographic process attracted the attention of Horace Greeley, who sent for him. The result was the formation of the American Photo-Lithographic Company, of which Ezra Cornell was president, Horace Greely secretary, and Mr. Mason manager. This was the first process company established. Soon after Mr. Mason dropped this and his other money-making work to establish the gratuitous department in Bellevue, over which he still presides.

## Patent Intelligence.

### Specifications Published.

,498. *March 22nd*, 1890.—"Machine for Cutting, Grinding, and Polishing Glass." Charles Marlow, 142, Park Lane, Aston, near Birmingham, Metal Plate Worker and Machinist.

One part of the improvement relates to the method of holding the glass, and the means used for removing it from one process to another without disturbing it; another to the collection and re-distribution of the sand, water, or other substance used as an abradent; and to the general distribution of the parts, which are so arranged as to reduce the space occupied; and to protect all moving parts from water, sand, or other substances; and to economise labour and time.

With this machine I propose to operate upon any form of surface, whether flat, raised, or depressed, by means of rotating cutters or rubbers guided in some such manner as those in use in wood-working machines, with such modifications as the nature of the work demands.

This machine is rendered so nearly automatic that one attendant may manage two or more machines, according to the size of the work thereon. The movements of the machine can, by guide rods, ropes, levers, or other suitable means be brought so as to be easy of control from one seat or position, however large the machine.

5,158. *April 2nd*, 1890.—"Apparatus for Holding and Changing Photographic Plates." Charles Henry Stanbury, 91, Fleet Street, London, Trunk and Portmanteau Maker.

This invention relates to a holder or box for containing sensitive plates both before and after they have been exposed, and to means for transferring the plates to and from the camera.

The box is provided with a number of slides with spaces between for receiving the plates, and the back of the camera is provided with two slides having a space between to receive a plate.

The outer ends of the slides carry flanges which come against the ends of the partitions between the slides so as to make as light-tight a joint as possible.

In order to transfer a sensitive plate from the box to the camera, the back is put on to the bottom of the box, and the lower slide of the box and the upper slide of the camera back are pulled out, whereupon the plate drops from the box into the back; the slides are then pushed in again. After the plate has been exposed in the camera, it is put back into the box, but this time at the top. In order to make room for it, the slides in the box are pulled out, one by one, in succession, allowing each plate to drop down into the next space below that which it previously occupied, so that now the top space is empty whilst the bottom space contains a plate. The back of the camera is then placed upon the top of the box, and its slide and the top slide of the box are pulled out; the plate drops into the box, and the slides are pushed in again. The next, or second, plate, which is now at the bottom of the box, is transferred to the camera in a similar manner, and so on.

5,681. *April 15th*, 1890.—"Frames and Suspenders for Pictures." Charles Rivington Shill, 67, Oakhurst Grove, East Dulwich Green, London, Accountant.

The portable mountings to consist of moulded or stamped devices made in wood, metal, *papier maché*, or other substances, the said devices to be attached or fixed to framable objects by means of cords or wires passing through suitably arranged wings or lips formed on the back of the said devices, whereby the whole arrangement is held in position by the cords or wires passing through the same, the whole forming complete furniture for mounting and suspending pictures, prints, looking-glasses, mirrors, or other objects suitable for framing.

5,753. *April 16th*, 1890.—"Operating Skylights." William Leggott, 27, Park Road, Bradford, Yorkshire, Brass Founder and Finisher.

This invention relates to certain improvements in the connection or coupling between the rotating vertical, or angular, operating rod or shaft and the rod or shaft attached to a pitched ceiling or roof, for opening skylights, fanlights, and the like; and has for its object the combination with the said rods or shafts of a connecting joint so arranged that it is applicable for coupling the said rods or shafts at any angle within a range of 90° or thereabouts, in such a manner that, on rotating one shaft, the other is also operated in like manner.

I accomplish my object in the following manner:—

To one end of a rod or shaft is secured a forked joint, between the arms of which is placed a cross-bar so arranged that it will move on its axis, and to which is attached a similar forked joint at right-angles to the first-named.

To the second-named forked joint is firmly secured at right-angles thereto another of similar construction, which is attached to a forked joint secured to the other shaft, and with a movable cross-bar similar to the one before described.

By connecting the shafts with a coupling constructed as described, they can be rotated without bevel wheels, with this advantage, the coupling will adapt itself, connect and rotate shafts placed at any angle within a range of 90° or thereabouts, whereas bevel wheels have to be made to suit the angle of the two shafts.

## Correspondence.

### THE LIVERPOOL INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

Sir,—The reference to the portraits of Professor Herkomer is somewhat in error; all are the work of Mr. F. Downer. I am aware this report was some oversight on the part of *The Liverpool Daily Post*, and for which your publication is not responsible. I thank you for the full and friendly words you have published. You will be glad to know that everything goes on most satisfactorily; 1,600 visitors on Saturday. Judges awards meet confirmation in every case, I think.

T. S. Mayne, *Hon. Sec.*

### THE NEW YORK MAY EXHIBITION.

Sir,—It will be of interest, perhaps, to all amateurs and other photographers to know that arrangements are now in progress for a very large, select, and important exhibition of photographs, including specimens of the best foreign work, to be held in New York at the Fifth Avenue Art Galleries, between 34th and 35th Streets, May 25th to June 6th, under the auspices of the Society of Amateur Photographers of New York. It will be the fourth of the joint series of exhibitions undertaken with the aid of the Photographic Society of Philadelphia and the Boston Camera Club.

The prospectus and entry forms have already been sent out, and the judges selected are, Thomas Moran, Will H. Low, and Edward Bierstadt—men well known in the respective branches of art which they represent.

Medals are to be awarded instead of diplomas, the number being limited to twenty-five. Exhibitions of slides will be held four nights during each week, and in a separate room there will be an exhibit of new and novel apparatus.

Foreign exhibitors may send pictures unmounted, which will be mounted and framed by the committee.

Exhibits should be sent to the Galleries by May 11th to ensure attention. The committee prefers that the very choicest work be sent, rather than a large quantity of ordinary pictures. Exhibits are invited from all photographers, and, when received, will be carefully attented to. Entry forms will be sent on application, and all correspondence should be addressed to—

F. C. Beach, *Chairman of Committee of Arrangements*, 113, *West 38th Street, New York.*

Fluorography.—Fluorography is, according to a contemporary, a process of transferring lithographic or phototypic prints to glass by means of fluorated ink, which, in contact with sulphuric acid, disengages hydrofluoric acid, which eats into the glass. The phototype is inked with the following compound:—

| | | |
|---|---|---|
| Soap | ... | 50 grammes |
| Glycerine | ... | 200 ,, |
| Tallow | ... | 50 ,, |
| Water | ... | 100 ,, |
| Borax | ... | 25 ,, |
| Fluorspar | ... | 50 ,, |
| Lampblack | ... | 15 ,, |

Negatives are taken and transferred to the glass. The latter is surrounded with a border of wax and covered with sulphuric acid of a density of 64° or 65° Beaumé. After fifteen or twenty minutes the acid is poured off and the glass is washed with water and cleaned with a solution of potassa, then washed with water again, and dried with a cloth.

## Proceedings of Societies.

### The Photographic Society of Ireland.

A meeting was held at the Rooms, 15, Dawson Street, Dublin, on the 13th inst., when the chair was occupied by Mr. Herbert Bewley.

A discussion on "Hand-Cameras" was introduced by Mr. J. White, who exhibited a number of different makes, but stated his preference for Rouch's "Eureka," the camera with which he had taken all his prize pictures. He stated that portability and simplicity were, in his opinion, the main features to be aimed at in the construction of a hand-camera.

A large number of members exhibited different makes of hand-cameras, a great many of such were home-made.

After the exhibition of hand-cameras; a number of slides, the works of the members, were put through the lantern.

A "Parveuu" flash-lamp was presented by Mr. Hedley for the use of members.

### The Lantern Society.

*March 9th.*—Mr. E. W. Maunder on "Photography as Applied to Astronomy."

Mr. Maunder commenced by dealing with solar photography, the sun having, he said, been the first celestial object which was photographed for scientific purposes. Soon after the discovery of the Daguerreotype process, photographs were taken of the moon, and also of some stellar groups, but these views did not serve any scientific purpose, and it is from the sytematic use of the photo-heliograph for obtaining photographic records of the state of the solar surface that the application of photography to astronomical purposes may be said to date. Mr. Maunder next spoke of the first photo-heliograph erected at Kew, and described in detail the later instrument now used at Greenwich, the work done by the instrument being illustrated by a series of slides showing portions of the solar surface. Other views were also exhibited prepared from the beautiful photographs taken by M. Janssen at Meudon, these being, as Mr. Maunder remarked, the finest solar photographs yet produced, showing as they do most admirably the details of the structure of the surface of the sun and the faculæ. While dealing with solar photography, Mr. Maunder also pointed out the strong grounds for connecting the periods of maximum solar disturbance, as marked by the frequency and extent of sunspots with terrestrial magnetic disturbances, and he farther alluded to the manner in which the periods of maxima and minima were marked by variations in the latitude of spots occurring. The next portion of the subject treated was the application of photography to the observation of total solar eclipses, the instruments used being described, and a number of photographs shown illustrating the structure of the corona as seen at recent eclipses. Leaving the sun, Mr. Maunder next proceeded to treat of the photography of the planets, illustrating his remarks by slides of Jupiter and Saturn taken at the Lick observatory, and by Professor Pickering, of Harvard. The task of photographing a planet was, he remarked, one of great difficulty, inasmuch as the very moderate light available did not admit of instantaneous exposures such as sufficed in the case of the sun, while the rapid rotations of Jupiter and Saturn on their axes prevented recourse being had to the long exposures which could be employed when photographing fixed stars. Altogether, up to the present time, although remarkable progress had been made, photographs of the planets left much to be desired, and could not compare favourably with the records obtained by skilful draughtsmen. In illustration of this, there were thrown upon the screen reproductions of a number of the best drawings of the planets of which direct photographs had been shown. Dealing next with stellar photography and photographs of nebulæ, Mr. Maunder remarked that in these departments photography left all records founded on visual observations far behind; in fact, the details of structure of nebulæ, as shown by the magnificent photographs of Common and Roberts, had been a complete revelation, and had resulted in an extension of our knowledge of such bodies, the value of which it was difficult to overestimate. For comparison, there were shown on the screen photographs of the Orion nebula and the great nebula of Andromeda, and reproductions of the best drawings available prior to the production of these photographs. In dealing with stellar photography, Mr. Maunder paid a well-merited tribute to Dr. Gill, of the Royal Observatory at Cape Town, whose photographic survey of the southern hemisphere—carried out largely at his own cost, and now practically completed—may be fairly said to have originated the scheme for the general photographic survey of the heavens determined upon by the International Congress, and the arrangements for which are now in an advanced stage. In treating of these matters, Mr. Maunder spoke at length on the admirable work done by Messrs. Paul and Prosper Henry, of the Paris Observatory; his remarks were illustrated by a large number of lantern slides showing the instruments used, photographs of the Pleiades, a portion of the constellation Cygnus, &c. In conclusion, Mr. Maunder dealt with the application of photography to solar and stellar spectroscopic research, and he exhibited on the screen the wonderful photographs obtained by Mr. Higgs from the red end of the solar spectrum, and examples of the spectra obtained by Professor Pickering from stars the duplicity of which had been revealed by the spectroscope, the spectra obtained on some days showing the duplication of the lines due to movements of the stars in the direction of the line of sight. This duplication of the lines showed that the spectrum in which it occurred was compounded of the light from two stars moving at different velocities with regard to the line of sight, and, by collating the observations at different dates, it was possible to calculate the periods of revolution and the masses of two stars which had never been separated visually by any telescope yet made, and, probably, never would be.

At the next meeting of the Lantern Society on March 23rd, the slides sent to England by the American Lantern Slide Interchange will be exhibited.

---

### THE WEST LONDON PHOTOGRAPHIC SOCIETY.

*March 13th.*—Mr. W. A. BROWN in the chair.

The PRESIDENT announced the result of the meeting called by Mr. Biden on the subject of federation, and said that he considered the smaller societies would be greatly influenced by the action of the Parent Society in the matter. The council had, however, resolved to send two delegates to attend the next meeting on the 23rd inst.

Mr. ROLAND WHITING then read a paper on "The Laws of Art as Applied to Photography," which he illustrated with sketches on the blackboard.

A long discussion ensued, principally on the subject of improving or otherwise the composition of photographic pictures by combination printing.

---

### THE LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

*March 11th.*—Mr. J. PORRITT in the chair. One new member was elected.

A communication was read by the HON. SECRETARY from the Midland Railway Company, in response to an application from this Society for reduced fares for members when travelling on photographic excursions, to the effect that, having considered the question, the management do not see their way to grant the request. It was resolved: "That this Society places itself in communication with the secretaries of various neighbouring societies, with a view of forming an association for obtaining facilities in this direction."

Mr. GEORGE BANKART then gave a demonstration on "Autotype or Carbon Printing." He prefaced the demonstration with a short description of the principles of the process, and the various results from different conditions of exposure and heat in development, and then proceeded to develop two 11 by 9 pictures printed on the Autotype Company's tissue; and the various stages of development, from squeegeeing on to opal, to the finishing of the process by development of the picture by hot water, were watched by many to whom the process was entirely novel. The demonstration was good, and yielded artistic pictures.

It was announced that at the April meeting Mr. Porritt would read a paper on "Photography, Past and Present," with notes on the quality of dry plates and lantern slides, and a few remarks on the object of our discussions.

---

### THE PUTNEY AMATEUR PHOTOGRAPHIC SOCIETY.

*March 11th.*—Mr. G. DAVISON gave a lecture on "The Art Side of Photography." After a few brief remarks on the relation of art to photography, he divided his lecture into the following sections:—Tone, balance of lines and focus, illustrating his remarks under each heading by handing round for inspection numerous prints, all of which were thoroughly appreciated. The printing-in of clouds, the trimming of prints, and the mounting and framing in the most effective manner, received his attention, as did the effect of an addition of mercuric chloride to the platinotype bath, the use of lenses and stops, and finally, pinhole photography.

At the close of his lecture, a discussion on the subject took place.

---

### THE DERBY PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held at Smith's Restaurant, Victoria Street, on Tuesday; Mr. RICHARD KEENE presided.

After the business was transacted, Mr. J. A. COPE, of the Derby Society, gave his paper on "The Chemistry of Photography." He explained the composition of a photographic dry plate and the action of light upon the same, together with all the chemical reactions which take place during development. He then touched slightly upon the different printing processes now mostly used in the practice of photography. A large number of negatives made by members of the Society was handed round for examination and discussion.

The Secretary distributed several samples of the Barnet plate, sent by Messrs. Elliott and Sons.

Six new members were elected.

A number of the members of this Society journeyed to Leicester on Thursday evening to a conversazione under the auspices of the Leicester Photographic Society, on the invitation of the vice-president, Mr. F. Pierpoint, who gave a lantern exhibition. At the close of the conversazione the Derby Society were entertained by the vice-president.

---

### THE HACKNEY PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held last Thursday, when Mr. ROLAND SMITH presided.

A paper, with demonstration, on "Bromide Enlarging" was read by Mr. S. H. FRY. He prefaced his demonstration by explaining the best kind of lens to use, and the diaphragm, advising the use of as large an aperture as would be consistent with sharpness and atmospheric effect. For vignetting he made a hole in a card, and obtained the vignetting effect by a rotary motion. If one part was not properly exposed, it could be treated locally or re-exposed (by washing off the developer, and bearing in mind that the paper was only about one-third as sensitive as it was before). As a good way to gauge exposure, when in doubt, say, for a matter up to three minutes, he advocated the placing of a strip of paper across the exposure board, and giving a number of exposures right across, taking a record; then after development the correct exposure could be decided on. The lecturer advised the use of plenty of safe orange light, and when judging the density it could best be done by looking through the paper. With respect to developers, he preferred the ferrous oxalate at present, though eikonogen may eventually usurp the place. The lecturer said he had found the acid baths unnecessary, provided the developer was perfectly washed out of the paper, and, moreover, if acid was conveyed to the fixing bath, there was danger of a formation of deposit of sulphur. He advised the soaking of the paper prior to development in distilled water.

Mr. GOSLING asked whether ordinary water would not do, but was informed that there would be oxalate of lime formed.

Dr. Gerard Smith asked if the paper would not become slower if wetted.

Mr. Fry said not if plain paper were used.

Mr. Harverson asked what would the exposure be for artificial light, and was informed that it depended on the quality of light; if oxy-hydrogen, just about the same as daylight.

Mr. Law wanted to know whether an ordinary lens would do for enlargement.

Mr. Fry thought it perfectly suitable. Other members took part in discussion.

The demonstration then took place; no acid bath was used; the paper and opals were washed with a large piece of cotton wool. A stain was perceptible as of fog, but on being treated by the lecturer with tincture of iodine it disappeared. In answer to a question by the secretary as to the extra cost of opals over bromide paper, Mr. Fry informed the members that there had to be such great care exercised in the cleaning that extra cost was incurred thereby, the slighest finger-marks affecting result.

The next meeting will be on April 9th, owing to adjournment for the holidays.

---

The Glasgow and West of Scotland Amateur Photographic Association.

A meeting was held in the Association's rooms on Monday, 16th March, when five new members were elected.

Mr. J. W. McKenzie gave a description and demonstration of the parchment collographic process recently brought before the London societies by Mr. Warnerke. Mr. McKenzie produced a number of prints, and the process was watched with interest by the members.

Mr. Hugh Reid exhibited a camera fitted with a telescope as a focussing finder, and showed negatives of vessels in motion taken with the apparatus.

The meeting closed with the usual show of lantern slides, amongst which were ninety-five views in the Yellowstone Park, U.S.A., and a number of miscellaneous slides by members.

---

Mr. Shapoor N. Bhedwar, who won one of the gold medals at the Liverpool International Photographic Exhibition, was a photographic pupil of Mr. R. W. Robinson.

Photogravure Prints.—We have received from Messrs. Annan and Swan some specimens of exceedingly fine prints by the photogravure process, which is noted for its capacity to give highly artistic results. One of the prints is an admirable likeness of Mr. J. W. Swan, which ought to be on public sale because of the great scientific services he has rendered to photography and electricity.

Received.—From Messrs. Perken, Son, and Rayment, the sixteenth edition of "Intensity Coils," being a beginner's guide to electricity, describing the way to make batteries, bells, coils, electric light, telegraphs, phonographs, and so on.——From Mr. H. Park, a catalogue, including a useful list, with prices, of camera fittings, with illustrations of the latter in exact sizes.——Another catalogue to hand is that of the Thornton-Pickard Manufacturing Co.'s photographic specialities, including shutters and shutter accessories, and cameras with accessories. The Company call attention to the improvement made in the "time and instantaneous" shutter, whereby the pointer does not require setting for each exposure, as in the earlier patterns.——From David Nutt, specimen pages containing Appendices and Vocabulary for Cyclists and Photographers, to appear in a new edition of "Swan's Colloquial French for Travellers."——From Ross and Co., a new catalogue, from which we learn that they have erected large new works near Clapham Common, and putting an improved form of iris diaphragm in their lens mounts.

---

All communications should be as brief as the importance of the subject will permit, when speedy publication is desired. Our space is overcrowded, and we now have contributions waiting for insertion which have been in type for some weeks.

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.**

**All Advertisements and communications relating to money matters, and for the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

☞ *The Photographic News will be published on Thursday next, on account of the Easter holidays. All communications should therefore reach the office not later than Wednesday morning.*

L. A.—*London Rainfall.* Our results do not quite agree; slight differences are, however, to be expected. We had, at Canonbury, an unbroken period of thirty-four dry days, viz., from February 1st to March 6th inclusive; then heavy rain fell on Saturday, 7th inst., amounting to ·47 inch, followed by more rain on the 8th, and then the blizzard.

W. A. & Co.—*Postage Stamp Portraits and Cheap Enlargements.* Several houses undertake reproductions of this character; amongst others the Artistic Photographic Company, Imperial Mansions, Oxford Street, W., and Mr. Harold Godwin, 2, Crown Court, Cheapside, E.C.

Exhibitor.—*Liverpool to Crystal Palace.* The dates are so close that it seems hardly possible for you to get your picture back from Liverpool in time for reception on the 6th April at the Crystal Palace Exhibition; but as the entry form for the latter need not be sent in until Monday week, 30th inst., there is still left to you the possibility of enquiring whether any grace is allowed to the Liverpool exhibitors.

A. M. M.—*Calculation of Cost.* From information received from a most trustworthy source, confirmatory of our own past experience, it seems almost impossible to work out a fixed ratio between profit and gross returns in any professional photographic business. As a rule, "the larger your return, the larger the proportion of profit," but much will depend upon outlay for rent and character of the work executed. The prices of platinum and hyposulphite are advancing, and silver also has been oscillating in recent years, facts which add to the difficulty of making a close calculation. In the same establishment profits have varied from 25 to over 50 per cent., according to the amount of business going, and this was one where spoilt prints and plates were, by good practice, assuredly kept down to very moderate limits. With a lower-class business, according to the locality, the profits might be either higher or lower than the scale now given.

C. T. (Sheffield).—*Photo-Mechanical Prints* In your district probably Mr. Graham Glen, of 2, Commercial Street, Leeds, could undertake the work.

E. Fischel (Amsterdam).—*Blue Carbon Paper.* This was made formerly by MM. Marion & Cie., Courbevoie, Paris, but there is not now much demand for a pigment paper of that colour.

W. M.—*Fluoride of Silver.* You are under a misapprehension with regard to this body; it cannot be *precipitated* within the texture of the paper, like chloride of silver, for it is extremely soluble in water. The easiest way of making it is by dissolving granulated silver in hydrofluoric acid contained in a platinum basin. Be careful not to inhale the fumes, and make it neutral by stirring in, finally, a little oxide or carbonate of silver.

E. W. F.—The papers have been sent on to you by post. We are told that the proviso on top line may now be disregarded.

D. H.—*Yellow Colouring Matter.* So far as can be judged from the small sample sent, the peculiar tint is got from fluoresceine. This body is soluble in water, especially in presence of alkalies, and gives with bromine a pink colour due to the formation of eosine.

J. T.—*Bronze Printing.* A reliable test is to moisten it with nitrate of silver. Pure gold leaf is not at all affected, whereas the imitation article at once reduces the silver from solution. By blotting off and touching the filter paper with yellow prussiate, you will see by a red-brown stain the indication of copper.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1699.—*March* 27, 1891.

CONTENTS.



## THE THEORY OF THE NEW HELIOCHROMIC PROCESS.

From the time of the production of Becquerel's heliochromic photographs half a generation ago, it has often been speculated that the colours might or might not be those of thin plates, and it is pleasing that the true theory of their production was first put forth in this country by Lord Rayleigh, the successor of Professors Tyndall, Faraday, Davy, and Young, as Professor of Natural Philosophy at the Royal Institution.

As Lord Rayleigh set forth in these pages on March 6th last, he published the explanation in the *Philosophical Magazine* of August, 1887, in which he says of Becquerel's photographs that the film "may be conceived to be subjected during exposure to *stationary* luminous waves of nearly definite wave-length, the effect of which might be to impress upon the substance a periodic structure recurring at intervals equal to *half* the wave-length of the light." He then speaks of hoping to follow up the subject experimentally, but did not do so; M. Lippmann, later on, working with the same theory, has obtained brilliant results. It is some satisfaction to know that the true fundamental principle of heliochromy was first enunciated by one of the ablest mathematicians and physicists in this country, although, afterwards, first proved to be true in France.

Early in 1888 Lord Rayleigh brought under the notice of the Royal Institution some remarkable researches and experiments of his own on the diffraction of sound, and, by the suitable manipulation of sound-waves, he produced phenomena analogous to those of the interference of light; in other words, just as in M. Lippmann's films, waves of light, by interference with each other, produce stationary bands of darkness, so did Lord Rayleigh cause waves of sound to act upon each other to produce in mid air stationary bands of silence. Just as Wiener applied a photographic film to search for and register interference bands of light, so did Lord Rayleigh employ a sensitive flame to indicate the presence of interference bands of sound.

The waves of sound to which the human ear is sensitive are long; the wave-length of middle C on the musical scale is four feet, and of the C one octave above it two feet. The sound-waves used by Lord Rayleigh were about half an inch in length, so short and sharp as not to be audible to the human ear; they were made by causing a current of air to blow steadily through a kind of small whistle. This was placed opposite the flaring sensitive flame and at a few yards distance; whenever the lecturer placed his hand between the whistle and the flame a sound-shadow was cast; the flame then ceased to flare and became quiescent, but whenever the hand was removed began to flare once more.

He then placed a board on the opposite side of the flame to the whistle, to act as a sound-reflector, and said:—"The places of greatest variation of density are the places of no motion; the places of greatest motion are places of no variation of density. By the operation of a reflector, such as this board, we obtain a system of stationary waves, in which the nodes and loops occupy given positions relatively to the board. You will observe that, as I hold the board at different distances behind, the flame rises and falls. I can hardly hold it still enough. In one position the flame rises, farther off it falls again; and as I move the board back, the flame passes continually from the position of the node—the place of no motion—to the loop or place of greatest motion, and no variation of pressure."* Here, then, in sound, we have a reflecting board exercising functions analogous to a reflecting surface in light; in the one case we have alternate bands of sound and silence in front of the board, and their presence indicated by a sensitive flame; in the other case—in M. Lippmann's process—we have bands of light and darkness in front of the mercury, and their presence indicated by effects produced in the interior of a transparent photographic film.

The ingenuity of this production of silence bands by means of sound-waves of air reflected from a wooden board is obvious; but the phenomenon is not parallel at all points with that of the interference of the waves of light, for the interstellar ether is almost entirely

* *Journal of the Royal Institution*, vol. xii., page 189, January 20th, 1888.

destitute of viscosity or fluid friction, whilst air is far from being such a perfect fluid. Still, the phenomena are closely enough related for our illustrative purpose.

No pigmentary colours are produced in the finished photographs, which merely break up white light so as to reflect the right prismatic colours from the right places. Diffraction gratings for producing diffraction spectra have no proper colour of their own. They are merely pieces of glass or polished white metal, ruled with innumerable fine lines by means of a machine-guided diamond point; yet they afterwards break up white light, so as to yield all the colours of the rainbow with brilliancy.

## THE PRIMULINE PROCESS IN COMMERCE.

The primuline diazotype process, which attracted so much attention last year at the British Association and elsewhere from its refreshing novelty, has been taken over by Messrs. Watson and Son, who are about to introduce it into the regular channels of photographic trade. This news is interesting, for the process is one of which the utilitarian possibilities are, for the most part, as yet undeveloped, but are likely to be evolved when experienced photographers begin experimenting in relation thereto. Two leading features of it are, that it is excessively cheap, and produces results marked by their brilliancy and by the variety of the resulting colours.

The largest class of profits is usually made by the first introduction of novelties to the public; as processes and methods grow old, competition does its work, and cutting prices become the order of the day when the results have to be sold to the masses of the population. High-class work of any kind, however, is always likely to hold its own when the results have to be sold to the cultured class of the community, which is more competent to judge artistic and scientific merits.

Should the primuline process become a fashionable "craze" like that of ornamenting china, it is likely to be in great public demand. Any photographer who has transparencies of any of his sitters, can borrow their white handkerchiefs, and, with their permission, in a few minutes on a sunshiny day, present them their likenesses printed thereon in brilliant colours, and so fixed as to resist the action of hot soap and water. This is certain to attract their attention, and to send them home talking about the matter among their friends. Indeed, this primuline process seems to well deserve the attention of professional photographers. Full details about the working of the primuline process are to be found in our last Year-Book.

The Chicago International Columbian Exhibition, 1893. —A proclamation by the President of the United States, Mr. Benjamin Harrison, has been made to the effect that satisfactory proof having been presented as to adequate grounds, buildings, and finances for this proposed great Exhibition for celebrating the 400th anniversary of the discovery of America by Columbus, he, in the name of the United States, declares that the Exhibition will be opened on May 1st, 1893, in the city of Chicago, Ill., and he invites all nations to take part in the commemoration.

## SEASONABLE PRECAUTIONS.

Now that this truly dreary winter, which has brought us so much snow and general discomfort, has nearly past away, we shall forget all about its cold and its cruel fogs until the dark days come round once more, when, perchance, we shall remember that it is time to commence grumbling again; but, for the present, we have something better to do, in looking forward to the speedy budding of the trees, and the general awakening of nature after her long sleep.

This refreshing change in the aspect of the world is even more welcome to the photographer than it is to others, for his work, as well as his pleasure, depends in great measure upon that same sun which causes the birds to sing and the flowers to bloom. And, in the case of out-door photography, whether it be professional or amateur in character, dependence upon the sun naturally becomes still more emphasised. Photographers, indeed, are looking forward to their first day in the field as eagerly as sportsmen of another kind anticipate with pleasure the first of September. In both cases, too, the implements of sport must be carefully overhauled to see that there is nothing wanted to mar the expected enjoyment; but, whilst the sportsman has little to do beyond seeing that his weapon is clean and bright, the photographer has to be far more particular before he can hope to win success.

As a knight of old had to try every joint of his armour before going into the lists, so must the photographer look most carefully to see that his apparatus has not deteriorated during its enforced period of rest. In spite of the best cabinet work—and there is little to complain of in the manufacture of cameras now-a-days—the best wood will sometimes warp after experiencing the vicissitudes of an English winter. A crack which is almost imperceptible to the eye will be quite wide enough to admit a glint of light, and such cracks will often make their appearance without apparent cause. Another weak point where light will occasionally creep in, is where the leather bellows of the camera is attached to the woodwork. Even the bellows part of the instrument itself is liable to injury, especially from the attacks of insects; and, although we have no such destructive creatures in this country as white ants, we have the ubiquitous cockroach, which appears to be able to make havoc of, and to digest any substance, with the exception, perhaps, of cast steel. Mice, too, will nibble away at leather if they cannot find anything else with which to appease their hunger, so that the bellows of the camera has at least two pests which hanker after it more or less. There are other parts of the camera which require looking to before work is recommenced, notably the rising front, and the junction of the metal flange of the lens with the woodwork. The dark slides, too, may be of the best make, and may have proved to be reliable against ingress of light, but this is no guarantee that they will remain so for ever. A corner joint may have given way just sufficiently to admit a tiny pencil of light, which will spoil every negative entrusted to its care. All these things should be most carefully examined, so as to save disappointment, for prevention is better than cure, especially in the case of damaged negatives, where cure is next to impossible.

But it is not alone the portable photographic apparatus that must be looked to at the beginning of a fresh season; the dark room and its appurtenances must also be overhauled. The most important feature to deal with first is the light-filtering medium, whatever it may consist of. All ruby media, whether of cloth or paper, are liable to change, especially if they have been exposed for any time to the action of daylight. We have seen specimens so situated that have, in a few months, changed from a rich and absolutely safe red to a washed-out pink that would hardly be a protection to a plate prepared from comparatively insensitive silver chloride. Even glass is not safe, but is liable to change, although the bleaching action here is not nearly so marked as in the case of paper or cloth. The medium protecting a lamp is not liable to such rapid deterioration, for it is not usually exposed to that energetic bleaching agent which we have in sunlight; but still the lamp should be looked to. One more word. At the beginning of a new season, clear the decks for action by eliminating from the dark room everything that is not absolutely wanted for work. Dismiss the empty bottles, pour away solutions of uncertain composition, make good all labels, clear away cobwebs and dust, and your work will be all the better for the trouble incurred.

## ELECTRO-CHEMICAL REVERSALS WITH THIO-CARBAMIDES.

BY COLONEL J. WATERHOUSE, B.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

Farther observations made with silver plates coated with a film of precipitated silver bromide in pairs of one exposed and one unexposed plate, connected with a very delicate suspension galvanometer, showed not only a distinct electric current between the plates immersed in the plain eikonogen-lithia developer, but a reversal of the current with plates immersed in some of the same developer to which five drops per ounce of the compound salt of thio-carbamide and ammonium-bromide had been added. With the ordinary developer, the exposed plate forms the negative pole of the circuit, whereas with the thio-carbamide developer it forms the positive pole. The same rule has been found to hold good with thio-sinamine. With the thio-carbamide developers the current is more powerful than with the plain developers. Farther experiment is, however, necessary with other plates to confirm this reversal of the current, which seems highly probable, and was to have been expected.

Blue Prints on Albumenised Paper.—Sensitise the paper with the following solution:—

| | |
|---|---|
| Citrate of iron and ammonium ... | $3\frac{3}{4}$ drachms |
| Water ... ... ... ... ... | 3 ounces |
| Red prussiate of potash ... ... | $2\frac{1}{2}$ drachms |
| Water ... ... ... ... ... | 2 ounces |

Mix equal parts (at the time of using), and float the paper for about half a minute, then dry. The prints may be mounted and burnished. The sensitised paper does not keep. —*Scientific American.*

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Colouring Silver Prints—Diapositives from Engravings and Prints—Printing on Wood—Combined Pyro and Hydroquinone Developer—Turpentine as an Accelerator.

*A Novel Method of Colouring Silver Prints.*—Dr. Miethe reports on a new method of colouring albumen prints, suggested by Ogonowski in his book on photochromy. It consists in the following. Ordinary salted paper is floated on a silver bath, printed rather weakly beneath the negative, washed out, toned and fixed as usually. The weak print thus obtained is placed, whilst still moist, on a sheet of wet blotting-paper, and together with it on a glass plate. The print, which by this procedure is kept moist, is then coloured with water-colours, only natural colours being, however, applied, and white body-colour; vermilion, chrome, and cadmium yellow are avoided. The whole is then allowed to dry, and the print floated from once to three times on a solution of salted beaten albumen, when it is again sensitised, and placed in the right position beneath the negative in the printing frame. It should now be printed as usually on albumen paper, then toned and fixed. The colours, which are prevented from coming off by the albumen film, are perfectly preserved, and the pictures obtained by this method are said to give splendid effects.

*How to Make Diapositives from Engravings and Prints in the Original Size.*—The following simple and trustworthy method is described by E. Ammann in the *Archiv.* A well-polished plass plate is coated with one of the well-known sensitive gum and bichromate solutions, as used in the powder process, and dried. The copper engraving or the wood-cut from which the transparency is to be taken, is placed with its back outwards in the printing-frame, the prepared glass plate being laid on it. It is then exposed, dusted-in with suitable colours, washed out, dried, and varnished. The transparency is then finished. In order to prevent the paper of the engraving from adhering to the bichromate film of the plate during printing, the back of the engraving or print is previously rubbed in with turpentine, and then laid aside for a few minutes. The paper is thus not only provided with fatty matter which prevents adherence to the glass, but it is at the same time rendered transparent, so that in dusting on the colours the grain of the paper remains invisible. If pure and clear turpentine is used, no trace of it will remain on the paper after evaporation.

*Printing on Wood.*—A professional photographer who does a great deal in making prints from negatives on sensitised wood blocks for the use of wood-cutters, was kind enough to demonstrate to me the other day his mode of working. It will, perhaps, be of interest to some of your readers:—

| | |
|---|---|
| Gelatine ... ... ... ... | 8 grammes |
| White soap ... ... ... ... | 8 ,, |
| Water ... ... ... ... ... | 500 ,, |

The gelatine is allowed to swell, dissolved by means of a hot water bath, and the soap added gradually with constant stirring. Finally, the solution is filtered through muslin. With this mixture, to which some zinc white is added, the wood block is well rubbed in, and allowed to dry; the film should be as thin and even as possible. The wood block is then, by means of a broad brush, coated with the following solution :—

| | |
|---|---|
| Albumen ... ... ... ... | 30 grammes |
| Ammonium chloride ... ... ... | 1·2 gramme |
| Citric acid ... ... ... ... | 0·2 ,, |
| Water ... ... ... ... ... | 24 c.c. |

The albumen is beaten up to a froth, and allowed to settle; then the water, the ammonium chloride, and the citric acid are added in the order indicated. After the coating has dried, the film is sensitised by means of—

| | |
|---|---|
| Silver nitrate ... ... ... ... | 3·2 grammes |
| Water ... ... ... ... ... | 31 c.c. |

Of which solution a little quantity is poured on and distributed with a glass rod. The surplus is poured off, and the block allowed to dry. Printing is done as usually, but it is not necessary to over-print. After printing, the surface of the block is immersed for about three minutes in a weak solution of common salt in water, in which the print will be bleached to some extent. It is then rinsed under the tap, and fixed for from four to five minutes by means of a concentrated solution of hypo. Finally, it is washed for about ten minutes under the tap, and then dried.

*A Pyro-Hydroquinone Developer.*—Dr. C. Schleussner, the well-known dry plate manufacturer of Frankfort-on-Main, whose plates have a very large sale in Germany, prefers the following combined pyro and hydroquinone developer to all others. The following stock solutions are prepared :—

*Stock Solution* No. 1.

| | |
|---|---|
| Hydroquinone ... ... ... | 20 grammes |
| Distilled water ... ... ... | 2,000 c.c. |

*Stock Solution* No. 2.

| | |
|---|---|
| Carbonate of soda ... ... ... | 100 grammes |
| Distilled water ... ... ... | 500 c.c. |

*Stock Solution* No. 3.

| | |
|---|---|
| Distilled water ... ... ... | 400 c.c. |
| Sodium sulphite ... ... ... | 60 grammes |
| Diluted sulphuric acid ... | 10 to 20 drops |
| Pyrogallic acid ... ... ... | 20 grammes |

The sodium sulphite should be dissolved and acidulated with sulphuric acid before the pyro is added. For use mix—

| | |
|---|---|
| Solution No. 1 ... ... ... | 40 parts |
| Solution No. 2 ... ... ... | 10 ,, |
| Solution No. 3 ... ... ... | 10 ,, |

The development may be accelerated by heating the mixture a little. It is well to commence development with an old solution, and to finish it with the fresh solution as soon as the high lights have made their appearance. This developer gives negatives of the character of wet collodion plates, *i.e.*, very fine details and high lights, combined with excellent printing quality.

*Turpentine as an Accelerator in Development.*—M. Wolf and P. Lenhard have discovered that turpentine oil, if added to the hydroquinone developer, acts as a powerful accelerator. They state that if a few drops of this oil be added to the developer, the reduction takes place much more quickly than without this addition, and that, at the same time, the shadows of the negative turn out much denser. Turpentine seems to act here similarly to hyposulphite of soda in the ferrous oxalate developer. Care should, however, be taken not to use too much of the oil, as this causes patches. The following formula was used by the authors :—

| | |
|---|---|
| Water ... ... ... ... | 100 c.c. |
| Soda ... ... ... ... ... | 8 grammes |
| Caustic soda ... ... ... ... | 0·5 gramme |
| Sodium sulphite ... ... ... | 5 grammes |
| Hydroquinone ... ... ... | 1·2 gramme |

To one-half of this quantity 3 drops of turpentine were added. I do not know, however, whether the *quantities* given here are quite correct, since the authors (Eder's Year-Book, 1891), in the formula for the hydroquinone developer, are talking of "parts," and in the case of the turpentine which was added, of "drops."

## AMERICAN INTERNATIONAL COPYRIGHT GRANTED FOR PHOTOGRAPHS.*

*Section* 5.—That section 4,959 of the Revised Statutes be, and the same is hereby amended, so as to read as follows: "Section 4,959.—The proprietor of every copyright book or other articles shall deliver at the office of the Librarian of Congress at Washington, district of Columbia, a copy of every subsequent edition wherein any substantial changes shall be made; provided, however, that the alterations, revisions, and additions made to books by foreign authors, heretofore published, of which new editions shall appear subsequently to the taking effect of this Act, shall be held and deemed capable of being copyrighted, as above provided for in this Act, unless they form a part of the series in course of publication at the time this Act shall take effect."

*Section* 6.—That section 4,963 of the Revised Statutes be, and the same is hereby amended so as to read as follows :—"Section 4,963.—Every person who shall insert or impress such notice, or words of the same purport, in or upon any book, map, chart, dramatic, or musical composition, print, cut, engraving, or photograph, or other articles for which he has not obtained a copyright, shall be liable to a penalty of 100 dollars, recoverable one-half for the person who shall sue for such penalty, and one-half for the use of the United States."

*Section* 7.—That section 4,964 of the Revised Statutes be, and the same is hereby amended so as to be read as follows :—"Section 4,964.—Every person who, after the recording of the title of any book, and the depositing of two copies of such book as provided by this Act, shall, contrary to the provisions of this Act, within the term limited, and without the consent of the proprietor of a copyright first obtained in writing, signed in the presence of two or more witnesses, print, publish, dramatise, translate, or import, or, knowing the same to be so printed, published, dramatised, translated, or imported, shall sell, or expose to sale, any copy of such book, shall forfeit every copy thereof to such proprietor, and shall also forfeit and pay such damages as may be recovered in a civil action by such proprietor in any Court of competent jurisdiction.

*Section* 8.—That section 4,965 of the Revised Statutes be, and the same is hereby amended so as to read as follows :—"Section 4,965.—If any person, after the recording of the title of any map, chart, dramatic or musical composition, print, cut, engraving, or photograph, or chromo, or of the description of any painting, drawing, statue, statuary, or model or design intended to be perfected and executed as a work of the fine arts as provided by this Act, shall, within the term limited, contrary to the provisions of this Act, and without the consent of the proprietor of the copyright first obtained in writing, signed in the presence of two or more witnesses, engrave, etch, work, copy, print, publish, dramatise, translate, or import, either in the whole or in part, or by varying the main design with intent to evade the law, or knowing the same to be so printed, published, dramatised, translated, or imported, shall sell or expose to sale any copy of such map or other article as aforesaid, he shall forfeit to the proprietor all the plates on which the same shall be copied, and every sheet thereon either copied or printed, and shall further forfeit 1 dollar for every sheet of the same found in his possession, either printed, copied, published, imported, or exposed for sale; and in case of a painting, statue, or statuary he

* Concluded from page 225.

shall forfeit 10 dollars for every copy of the same in his possession, or by him sold or exposed for sale, one-half thereof to the proprietor, and the other half to the United States."

*Section* 9.—That section 4,967 of the Revised Statutes be, and the same is hereby amended so as to read as follows:—"Section 4,967.—Every person who shall print or publish any manuscript whatever, without the consent of the author or proprietor first obtained, shall be liable to the author or proprietor for all damages occasioned by such injury."

*Section* 10.—That section 4,791 of the Revised Statutes be, and the same is hereby repealed.

*Section* 11.—That for the purpose of this Act each volume of a book in two or more volumes, when such volumes are published separately, and the first one shall not have been issued before this Act shall take effect, and each number of a periodical shall be considered an independent publication subject to the form of copyrighting above.

*Section* 12.—That this Act shall go into effect on the 1st day of July, A.D. 1891.

*Section* 13.—That this Act shall only apply to a citizen or subject of a foreign State or nation when such foreign State or nation permits to citizens of the United States of America the benefit of copyright on substantially the same basis as its own citizens, or when such foreign State or nation is a party to an international agreement which provides for reciprocity in the granting of copyright, by the terms of which agreement the United States of America may, at its pleasure, become a party to such an agreement. The existence of either of the conditions aforesaid shall be determined by the President of the United States by proclamation made from time to time as the purposes of this Act may require.

---

PHOTOGRAPHIC PRINTS OF CRYSTALS (formed under a pressure of 1,500 atmospheres).—M. Amagat, Professor of Physics at the Faculty of Lyons, has devised an appliance which not only allows us to see the solidifying of certain bodies under considerable pressure, but also to obtain crystals that are perfectly sharp, and to photograph them. He placed under the eyes of the Academy of Sciences four directly enlarged prints of these crystals, obtained with the appliances and with the assistance of M. Donnadieu, Professor of Geology of the same Faculty. We have here a very interesting application of photography called upon to give the proof of some curious phenomena, whose existence might be contested were it not for this important mode of vision and record.—*Moniteur.*

THE ROYAL INSTITUTION.—The following are the lecture arrangements after Easter:—Mr. J. Scott Keltie, three lectures on the Geography of Africa, with special reference to the Exploration, Commercial Development, and Political Partition of the Continent; Dr. E. E. Klein, three lectures on Bacteria: their Nature and Functions (the Tyndall Lectures); Mr. William Archer, four lectures on Four Stages of Stage History (the Betterton, the Cibber, the Garrick, and the Kemble Periods); Professor Dewar, six lectures on Recent Spectroscopic Investigations; Dr. A. C. Mackenzie, four lectures on the Orchestra considered in connection with the Development of the Overture; Professor Sylvanus P. Thompson, four lectures on the Dynamo; Mr. H. Graham Harris, three lectures on the Artificial Production of Cold; Professor A. H. Church, three lectures on the Scientific Study of Decorative Colour. The Friday evening meetings will be resumed on April 10th, when a discourse will be given by Sir William Thomson on Electric and Magnetic Screening. Succeeding discourses will be given as follows:—April 17th—Professor A. W. Rücker, Magnetic Rocks; April 24th—The Rev. Canon Ainger, Euphuism, Past and Present; May 1st—Mr. James Edmund Harting, Hawks and Hawking; May 8th—Professor W. Ramsay, Liquids and Gases; May 15th—Professor G. D. Liveing, Crystallisation; May 22nd—Professor J. A. Ewing, The Molecular Process in Magnetic Induction; May 29th—Mr. David Gill, LL.D., H.M. Astronomer at the Cape of Good Hope, An Astronomer's Work in a Modern Observatory; June 5th—Mr. St. George J. Mivart, M.D.; June 12th—Professor Harold Dixon, The Rate of Explosion in Gases.

## THE BRITISH ASSOCIATION.

### METEOROLOGICAL PHOTOGRAPHS.

THE Committee on Meteorological Photography of the British Association for the Advancement of Science, consisting of Mr. G. J. Symons, F.R.S. (chairman), Professor R. Meldola, F. R.S., Mr. John Hopkinson, F.L.S., and Mr. Arthur W. Clayden, M.A. (secretary), has issued the following circular:—

Photographs are desired of clouds, lightning, hoar-frost, remarkable hailstones, snow-wreaths, avalanches, glaciers, storm-waves, waterspouts, tornadoes, dust-whirls, halos, parhelia, or any other meteorological phenomena or their consequences.

### GENERAL INSTRUCTIONS.

1. As soon as possible after exposing a plate, number it and fill in the details relative to it on one of the forms supplied. The more completely these are filled in, the more valuable will the photograph be.

2. The size of the plate is immaterial, provided that the focus is sharp. Use a magnifier when focussing, and for objects like clouds focus upon a distant tree or building.

3. Use a lens which does not distort the image.

4. Do not touch up either negative or print.

5. When photographing any object which is moving or changing, a series of views taken at short intervals, so as to show the progress of the phenomenon, will be of especial value.

6. Whenever possible, a figure or other object of known dimensions should be introduced, in order to serve as an approximate scale.

### CLOUD PHOTOGRAPHY.

For heavy clouds no special apparatus is required, but exposure must be shorter than for ordinary landscape work. For very thin clouds exposure must be extremely short, and development very cautious. Fair results may then be occasionally obtained without special means.

In order to obtain better and more certain results three methods have been adopted:—

(*a*) Using a slow plate and rapid lens, with short exposure; (*b*) using an ordinary plate and lens, but with a sheet of pale yellow glass in front of the lens; (*c*) using an ordinary plate and lens, but placing a plane mirror of black glass in front of the lens so that its surface makes an angle of about 33 degrees with the axis of the lens. The image reflected in the mirror is fairly easy to photograph.

The Committee hope to receive examples of each of these processes, as well as examples and descriptions of any other special devices which may be adopted by observers.

### LIGHTNING PHOTOGRAPHY.

When a thunderstorm occurs at night it is very easy to photograph the flashes of lightning.

Fix the camera rigidly (do not hold it in the hand), and expose it to a part of the sky where flashes are frequent.

As soon as one flash has crossed the field of view, change the plate.

Whenever possible, count the number of seconds between seeing the flash and hearing the beginning of the thunder. Note this time on the print or form.

If you have two cameras, some useful results may be attained by using one as described above, and holding another in the hand, pointing in about the same direction, but kept in constant oscillation. It is hoped that two photographs of the *same flash* may be thus secured.

Another desirable experiment is to fix both cameras in the same direction, change the plates in one after each flash, but leave the plate exposed in the second until six or eight flashes have crossed the field of view.

If the camera is placed in a window this must be open, as the interposition of a window pane may give rise to multiple images.

Be particularly careful to note the exact time and direction of each flash photographed.

A rapid lens, with a stop $f/8$ or thereabouts, should be used for lightning.

Prints, which may be mounted or unmounted, should be sent as early as possible to the Secretary, at Warleigh, Tulse Hill Park, London, S.W.

## AN INTERESTING LETTER BY SIR DAVID BREWSTER.

BY WM. LANG, JUN., F.C.S.

When in Edinburgh recently, I secured a relic of early photographic days in the shape of a letter by Sir David Brewster, which is sufficiently interesting, I think, to bring before the readers of the Photographic News. The contents of the letter are devoted to an account of an accelerator to be used in connection with Niepce de St. Victor's albumen process. As is well known, one of the principal drawbacks inherent to the Frenchman's process was the long exposure required in the camera. There is no Christian name attached to the Mr. Ross to whom Brewster had been writing; we are, therefore, only able to surmise as to the actual recipient of the communication. From the fact that Messrs. Ross and Thompson, of Edinburgh, were at that time engaged in working the albumen process, it may be a safe assumption to go upon that the Mr. Ross of the firm indicated was the individual to whom the letter was addressed. Without farther preface the letter may here be given:—

*St. Leonard's College, Sept. 10th, 1850.*

Dear Sir,—I have just received an account of the new method of M. Niepce de St. Victor for accelerating the process in albumen. It consists in adding 3 or 4 grammes of honey to one white of an egg along with 30 or 40 centigrammes (or 3 or 4 grammes) of iodide of potash. The albumen, when dry, is immersed for ten minutes, at the utmost, in a solution of—

| | | |
|---|---|---|
| Nitrate of silver | ... ... ... | 6 grammes |
| Combustible acetic acid | ... ... | 12 ,, |
| Distilled water | ... ... ... | 60 ,, |

A white ground is placed behind the plate of albumen in the camera, and the picture is brought out with hot gallic acid, the best pictures being those that remain several hours in the acid. The albumen of old eggs is more apt to peel from the glass than that of fresh eggs, and to prevent this the albumen, after the picture is upon it, and quite dry, may be covered with a thin layer of gelatine or picture varnish.

The time for a landscape in diffused light is two or three seconds, the time for a portrait from five to six seconds. The time is shortened by using a thicker plate of albumen, by using old eggs, and the longer the aceto-nitrate solution has been used the quicker is the process, which is also accelerated by a more thorough washing of the plate of albumen.

The albumen of a duck's egg peels less from the glass than that of a fowl; the albumen from blood is very accelerating, but it does not adhere well to the glass unless it is previously coagulated with azotic acid. Syrup and the serum of milk (whey) answer as well nearly as honey.—I am, dear sir, ever most truly yours, D. Brewster.

The year 1850, in which the foregoing had been penned, was one of varied experiences to Brewster. In the first month of the year he had the misfortune to lose his wife, a daughter of the famous Macpherson, known generally as Ossian Macpherson. In the spring, Brewster, along with his daughter, visited Paris, where he renewed his acquaintance with Arago, the famous astronomer, a tie of friendship which had first been formed in the year 1814. Other celebrities no less famous in their own particular walk were at this visit thrown into Brewster's company; notably, Guizot, the historian, Leverrier, the astronomer, and De la Rive, the electrician. A week or two having been spent in London, Brewster and his daughter afterwards visited Fox Talbot at Windermere, who, during the summer, repaired to his residence there. We can well understand how congenial would the company of these two philosophers be to each other, and that among many other topics of scientific interest, the possibilities of photography would be by no means overlooked.

It may be here stated that the two scientists had—if not before—formed a friendship in 1836, for on the occasion of the sixth meeting of the British Association, which was held in Bristol, we find Brewster spending the previous week at Lacock Abbey, the ancestral home of Talbot.

Brewster may be said to have been one of the chief promoters of the British Association. It was, therefore, peculiarly appropriate that when this body visited Edinburgh for the second time, in 1850, Sir David Brewster should have been elected president. It was the twentieth meeting of the Association, and the opening took place on July 23rd.

Enough has been said to indicate that the year in which the letter we have brought before our readers was written was one of the most eventful in the whole of Brewster's career.

It will be noted that the address heading the letter to Mr. Ross is that of St. Leonard's. Brewster, at the time of writing, was still principal of the United College of St. Salvator and St. Leonard in the university of St. Andrew's, an appointment bestowed on him in 1838, and which was held by him for twenty-three years. In 1860 he was made principal of the Edinburgh University, and his connection therewith was only severed by his death in 1868, having reached the advanced age of eighty-six years. In the memoirs of Sir David Brewster, published by his daughter, Mrs. Gordon, in 1869, under the title of "The Home Life of Sir David Brewster," we find the following:—"My father's connection with photography and photographers might well furnish a chapter of his life in competent hands. A large correspondence was kept up with Mr. Fox Talbot, M. Claudet, Mr. Buckle, Paul Pretsch, Messrs. Ross and Thompson, and other eminent photographers." Could these past memorials not be yet gathered together, and a compilation made? One of the last acts of Brewster's life was to bear testimony to the scientific worth of a former friend of his—M. Claudet, the eminent London photographer. Brewster was the first president of the Photographic Society of Scotland, a society founded in 1856. In connection with the stereoscope, Brewster's name is generally put forward as the inventor, but this he always disclaimed. It was only a modification of the original idea which he sought to get credit for, viz., the lenticular stereoscope, but, all the same, it was this particular form which popularised the instrument. There is one optical appliance of Brewster's, however, and one which seems to be now-a-days overlooked altogether, regarding which there can be no dubiety as to the author. I refer to the kaleidoscope. Many other optical arrangements were devised by this philosopher, but it would be beyond the limits of this communication to enter upon these. Brewster had a facile pen, and his works remain testifying to a beauty of expression combined with intellectual gifts of the very highest order. His "More Worlds than One," "Life of Newton," and many others, are well worth being perused by those to whom Brewster is little more than a name.

Cool as a Cucumber.—"The coolest man I ever knew in my life," said a Congressional arrival, "was a native of Kansas. A cyclone had set him down, with his entire family and a portion of his furniture, within twenty feet of my house. I said to him: 'Hello, Sam! what are you doing over here?' 'Oh,' he replied, as he dumped a handful of tobacco into his pipe, 'I just took a snap-shot, and now I want to get a *time*-exposure before the next gust comes on.'"

## THE PERMANENCY OF PHOTOGRAPHS.*

BY FR. WILDE.

*Translated from the German by J. F. Sachse.*

'HE following communication to the *Photographisches 'ochenblatt* (Berlin, Nov. 27, 1890), by Fr. Wilde, of örlitz, a photographer of over forty years' experience, iould be carefully read and studied by all photographers. rofessionals as well as advanced amateurs. We have ideavoured to reproduce the paper with all the idiom of ie original, and trust that it has not lost any of its excel-ence in the translation from the language of the Fatherland.

With great injustice has the reproach of instability been often cast upon our silver prints. Usually this has een done for advertising purposes. In the commence-ient of the seventies it was done in the interest of the arbon or pigment process; in later years, to boom up ie platinum process. I, however, claim, according to iy own experience and observations, that when a silver rint changes or fades, it is entirely due to carelessness in ie process of its production, such as insufficient fixing or on-elimination of the hyposulphite of soda, or the use of nsuitable paper or faulty preparation of the same. Out f my long practice as a photographer—since 1848—I ossess specimen silver prints from each year, and all are ultlessly preserved. The oldest photograph in my ossession was made in the fall of 1850. Prior to that me I made Daguerreotypes exclusively; the demand for iese ceased only with the introduction of the collodion rocess. At that period photography was not so easy or onvenient as it is to-day. There was no extensive echnical literature, in which thorough professionals so isinterestedly published their experiences for the good of ie profession in general. No paper especially manu-ictured or prepared for photographic purposes was to be btained in the trade, nor were the necessary chemicals to e obtained in their requisite purity without the greatest ifficulty.

Prior to the introduction of the collodion process the egatives were made on paper, which the photographer ad to prepare, as well as that for the prints. The latter emained the case for a long time, even after glass was ubstituted for paper. All causes of failure had then to e sought for at home, and could not, as now so often ie case, be shifted upon the shoulders of the manufacturer, 'ithout cause or justice. Those who went through this poch of photography—and there are but few of such eterans—must admit that the progress which the art has iade with such giant strides is not altogether due to the rofessional photographer, but that to the amateur, with is equipment of greater scientific knowledge, much of he credit is due. On paper prepared merely with the alts, the image invariably sunk more or less into the aper; to remedy this defect, additions of various ubstances were made to the salting solution, such as ifferent kinds of starch (arrowroot paper), or decoctions f various mosses (algein paper), of gelatine, whey, or asein, in connection with such acids as tartaric, citric, or uccinic acid. The best results which I ever obtained vere on a strong, somewhat rough Steinbach paper, which vas prepared with casein, sodium chloride, neutral citrate f potassium, and floated upon an eight per cent. silver olution. They were more vigorous than prints on lbumenised paper, and reproduced the finest detail and eauties of the negative better than the latter.

* From the *American Journal of Photography*.

The gold baths for toning prints were not known. With sulphurous fixing baths the prints were simultaneously fixed and toned—a method valueless for albumen; therefore it was only used occasionally for landscapes and architectural subjects. It was not until the discovery of the gold toning bath that we were enabled to give the desired tones.

To return to our subject, even such prints as were produced by the silver-sulphide toning bath, which have been in my possession since the commencement of the early fifties, have kept perfectly, without exception. This is the result of the great care which I always insisted upon to thoroughly eliminate all traces of hypo from the prints. The method I follow was communicated to me by Lutze. Although it is but rarely practised, I would recommend it to all the craft, on account of the excellent results. The method is as follows. The well-fixed prints are placed direct from the hypo into a solution of common salt for sixty or ninety minutes, during which time the solution is frequently renewed until, when a piece of the paper is chewed, the taste is clear salt, without any disagreeable after-taste. Then the prints are to be washed in clear water until the same test shows that the saltiness has also disappeared. This method may seem to many home-baked and mechanical; still, it is valuable in the practice.

I have already mentioned that faulty or unsuitable preparation of the paper may cause an instability of the silver print. This is especially true of prints on albumenised paper if the albumen is more or less coloured with pink or violet. Prints on such paper in the course of time all assume a dirty colour, while on paper coated with a film of uncoloured albumen the prints remain unaltered. When albumenised paper was first introduced, it was prepared by the individual photographer from pure egg-albumen, without the addition of any colouring matter. It is only since the wholesale production of photographic papers that the various shades of colour have been introduced. In later years, however, a little more caution is exercised in the use of such papers; the use of a decided pink shade is especially on the decline. The thickness of the albumen coating on the paper is also a factor in the stability or permanency of the photograph. Photographs made by myself thirty years ago, on paper with a thin, colourless coating of albumen, have kept much better than many made in later years on paper which was heavily albumenised.

The object in introducing albumenised paper was not to obtain a high gloss, but mainly to keep the image upon the surface of the paper by the aid of its thin, hard surface. The small form "visite" whole figure, which dominated for several years, gave the incentive for a paper with a heavier, glossier coating. At present, in carte and cabinet sizes portraits only are required, and in these we can well dispense with the exaggerated gloss so often seen. It is a matter of taste whether the addition of a high gloss is desirable for portraits, about which we will not argue. Taste and demand are regulated by fashion. Many of our fashions are extremely ugly; nevertheless, the public demand them because they are the fashion. Many of our best artists abhor the highly glossed photographic portraits, and find in the platinum print all requisite requirements.

Albumen films after a time all incline to become yellow, even if ever so little. As I became aware of this fact, years ago, I tried the means taken by our domestics to keep their washed linen white, viz., before hanging up to dry they draw them through a blue water, to prevent yellowness and keep the linen perfectly white. The photographic prints on uncoloured albumen paper, after being fixed and well washed, were placed for a short time in a bath of water coloured with the finest cobalt blue. Even if the water appears dark it leaves but a slight tinge, which suffices to remove the yellow tinge so apt to show in the white surfaces on the print.

*(To be continued.)*

## THE FEDERATION OF LONDON AND SUBURBAN PHOTOGRAPHIC SOCIETIES.

ON Monday evening last, the 23rd inst., a meeting was held at the rooms of the Photographic Society of Great Britain, to consider the proposals for a federation of London and suburban photographic societies on the lines sketched out by Mr. Biden in the circular convening the assembly.

On this, as on the previous occasion, Mr. Biden occupied the chair.

The Chairman said that many of the photographic societies to whom he had sent notices of the photographic meeting, and requests to appoint delegates to attend it, had done so. Others had expressed themselves as desirous, above all, to know whether the Photographic Society of Great Britain would place itself at the head of the federation, as they thought that was the main point. That Society had sent two representatives to attend this meeting, Mr. Leon Warnerke and Mr. Addenbrooke. The object of the Photographic Society of Great Britain being rather the advancement of the photographic art than the benefit of the individuals forming the Society, he thought those present would do better to consider, in the first place, what were the requirements to be met in a set of rules that should suit themselves. They could not ask the Photographic Society to put themselves on an equality with societies that might only have existed for three years. This primary object was to benefit the smaller societies, which were those that felt the want of such an arrangement. He therefore proposed the first resolution : "That it is desirable to form an association or federation of societies and clubs whose members are interested in photography."

Mr. A. Mackie suggested that it would be better that resolutions should be proposed and seconded in the usual way, and for a time an effort was made to carry this suggestion into effect.

Mr. W. Bedford would like to know whether there was any understanding that speakers at this meeting were those only appointed as delegates to speak in the name of their societies.

It was decided that Mr. Bedford should be heard, although not an appointed delegate.

Mr. Leon Warnerke said that the question of federation had been partially discussed by the council of the Photographic Society of Great Britain, and that Sir H. Trueman Wood, Mr. Addenbrooke, and himself, had been appointed to consider the question, and report thereon. Sir H. T. Wood was not able to be present that evening, but Mr. Addenbrooke and himself would report upon the decisions that might be come to.

Mr. Brockhurst, of the Holborn Camera Club, thought that it was a weak point of the present scheme, that it took no account of those individuals, of whom there was a very large number, who did not belong to any society. He thought that the federation might adopt the principle of being a union of individuals, and if those individuals happened also to be members of a photographic society, they might, perhaps, be admitted at a reduced rate.

The Chairman said that he did not propose to enter into competition with the existing societies by starting a new one. His object was to help societies by obtaining facilities such as could only be got by union or federation.

Mr. Bedford thought he would be justified in saying that the Photographic Society of Great Britain was favourably disposed to the idea of a federation, and was only waiting for a move to be made.

Mr. Warnerke said that the Council of the Photographic Society wanted to know something definite as to what was proposed by federation before it could say whether it was prepared to join in it or not. At a recent meeting of the Council, a definite proposition from the Milan Photographic Society for interchange of privileges was received and at once agreed to.

Mr. Malby, of the Toynbee Camera Club, proposed, and Mr. Goodhugh, of the North Middlesex Photographic Society, seconded, the resolution affirming the desirability of forming a federation, and this was carried.

Mr. Brown, of the West London Photographic Society, said that the members of his society considered that it depended principally upon whether the Photographic Society of Great Britain would join in the federation as to whether they themselves would think it desirable to do so. If there were to be two federations, the one adopted by the Photographic Society of Great Britain, and the other not, the latter would do no good.

A resolution was then passed to form a committee to consider the proposed rules and articles of association, and the following were nominated members of that committee :—Mr. Biden, Toynbee Camera Club ; Mr. Barrett, People's Palace ; Mr. Brockhurst, Holborn ; Mr. Clark, North London ; Mr. Cherry, North Middlesex ; Mr. Edwards, South London ; Mr. Rumbold, Sydenham ; and Mr. White, Ealing.

A vote of thanks was passed to the Photographic Society of Great Britain for the use of its rooms, and one to the chairman, and the meeting was then adjourned till the committee appointed should be prepared to report.

IT is only by labour that thought can be made healthy, and only by thought that labour can be made happy.—*Ruskin.*

THE AMERICAN ABROAD.—Brown (to Robinson, who has been abroad) : "And so you have returned from your long-looked-forward-to journey to the famous scenes of the Old World, to the tombs of statesmen, martyrs, and philosophers, to the sublime Alps, great London, and gay Paris. Tell me, old man, what have you done ?" Robinson (proudly) : "I have exposed seven hundred films !"

MR. CHUGWATER ASSISTS.—Mrs. Chugwater, arrayed in her best gown, was sitting for her photograph. "Your expression —pardon me—is a little too severe," said the photographer, looking at her over his camera. "Relax the features a trifle. A little more, please. Wait a moment." He came back, made a slight change in the adjustment of the head rest, then stood off and inspected the result. "Now, then. Ready. Beg pardon—the expression is still a little too stern. Relax the features a trifle. A little more, please. Direct your gaze at the card on this upright post and wink as often as you feel like it. All ready. One moment again—pardon me—the expression is still too severe. Relax the——" "Samantha !" roared Mr. Chugwater, coming out from behind the screen, and glaring at her savagely, "smile, darn you ! smile !"—*Chicago Tribune.*

ACCELERATING IRON PHOTO-SALTS.—The following paragraph appears in last week's *Nature* : —"In the second of the Cantor Lectures on 'Photographic Chemistry,' delivered on Monday, the 16th, at the Society of Arts, Prof. Meldola called attention to the importance of the principle of associating other substances with the compound undergoing photo-chemical decomposition, so as to increase the sensitiveness of the latter. As an illustration of this principle, the lecturer alluded to a discovery which has recently been made, and which was practically demonstrated by the discoverer, Mr. F. H. Varley, at the conclusion of the lecture. By associating iron salts with suitable sensitisers, it has been found possible to prepare films quite as sensitive as any of the modern gelatine emulsions, and containing no trace of any silver compound. The advantage of such films, from an economical point of view, is obviously very great, and a new departure in the applications of photography to scientific and other purposes is likely to originate with the exaltation of the sensitiveness of iron salts." The preceding paragraph erroneously ascribes the discovery to Mr. F. H. Varley ; it was made by Mr. Friese Greene, and subsequently improved by Mr. Varley.

## THE NEW HELIOCHROMIC DISCOVERIES.*

BY LEON VIDAL, EDITOR OF "LE MONITEUR DE LA PHOTOGRAPHIE," PARIS.

RECENTLY considerable attention has been given to the communication of Professor Lippmau to the Academy of Scieuces iu relation to the photography of colours. It may be interesting to the readers of *Wilson's Photographic Magazine* to be posted in regard to this discovery, and to have these details from au eye-witness of the results obtaiued. For this reason I dedicate to them this explanatory note made just after an interview with Professor Lippmann himself. He was good enough, in his laboratory at the Sorbonne, to show me his results, his appliances, and to explain thoroughly his method. The prints of the spectrum which he showed me have, for the most part, a brilliaucy which has never been possessed by the colours of the spectrum reproduced by other methods (processes of Becquerel, &c.). In fact there is colour, brilliant colour.

M. Lippmann's experiments are based on interferences, consequently he acts with the aid of a sensitive film resting on a reflectiug surface. The incideut rays pass through the film until meeting with a metallie surface (this is mercury); they are then reflected and again pass through the sensitive film. From this meeting of the incident rays aud the reflected rays is produced what is called interference. There is formed in the body itself of the sensitive film a succession of *maxima* corresponding to the phases of light, and of *minima* correspouding to the phases of obscurity. The length of a luminous ray is but a very small portiou of a millimetre, aud, admitting that the thickness of the film is one-twentieth of a millimetre, there is produced iu this thickuess considerable quantities, giving, ou an average, from 150 to 200 white and black rays, and resulting from the development after the actiou of the light. This development blackens all the zones in which the *maxima* have been produced, whilst in the zones of the *minima*, obscurity having reigued, there has been no photographic action, aud consequently the sensitive film remaius uuchauged. It follows that after development and fixiug iu the ordinary mauner, we have a film divided into an infinity of black parallel laminæ, separated from each other by white spaces, and the iutervals have exactly the length of the wave characterising each colour. In the present case we only refer to the spectrum, either for the primary colours isolated from each other, or mixed in definite relatious.

If it were possible to cut through the film, and to count the laminæ in the portious correspondiug to each of the seven colours, we would find unequal quantities of laminæ, and especially unequal distauces between each lamiua for each of the colours. But in reality no colour would exist, except the network having the faculty of causing the light to produce for the eye the seusatiou of colour. There would be no more colour than in soap-bubbles, although these appear to us most richly coloured. The phenomenon is also produced with laminæ of mica, so that, according to the thickuess of these laminæ, we have any desired colour of the spectrum, although the mica lamina is absolutely colourless.

The analogy is striking betweeu the results obtaiued by Professor Lippmann, and the examples giveu above. In order to obtain theur he covers a glass plate with a coating, serving as a vehicle for a seusitive silver salt, but in such a manner that the film is continuous, and free from granulations. He applies the sensitive film direct to a mercury bath, aud he causes the image of the spectrum to fall on the sensitive film through the glass. The exposure lasts from about one to two hours. Development and fixing as usual. With orthochromatic plates sensitive to the red, especially, the time of exposure would be much reduced. This method is somewhat analogous to that of storing souorous vibrations in the phonograph. The sensitive film stores away luminous vibrations which will show themselves as soon as the surface comes in contact with the luminous rays. We may say with reason, therefore, that the colours are permanent, as they caunot disappear unless the physical condition of the film is modified to the poiut of destroying the laminæ by crushing them.

It is not possible yet to draw any practical conclusions from the interesting facts which have just been explained, but there must be a beginning to all things, and we fiud ourselves here in the presence of the most rational starting point, one the most likely to lead to the true solution of the difficult problem of the representation of the colours. There are, however, two serious objections to oppose to the easy practical use of this ingenious and seductive process. The first is based on the uuequal sensitiveuess of the plates for the different colours; the secoud, because the interferences are only produced in a regular manner with pure colours. In this case the *maxima* aud *minima* are equidistant for rays having a given leugth of wave; but if the colours are complex or mixed with white light, the equidistauce yields to some period from which results an irregularity iu the arrangement of the films of reduced silver, which no louger give the seusation of the complex colour which has produced this particular dispositiou. It is this last objectiou, especially, which seems to us the most serious. We shall have to wait new experiments on mixed colours iu order to exactly ascertain if the corresponding vibrations are produced in the midst of the profusiou of waves of all lengths. We cannot yet say that this will not be, but it will be necessary to verify this discovery by experiment before being able to affirm its truth.

* Abridged from *Wilson's Photographic Magazine*, Philadelphia, March 7th.

---

HE: "Do you think the photograph I mailed you the other day was like me?" She: "I hope not; when it came it was broke."

GROTESQUE PHOTOGRAPHS.—It happens to all amateurs, and, alas! to professional photographers, to have failures in making their negatives. We think to please them by indicating a means of utilisiug what, in any less noble art than photography, we would designate as "botches." Here is the method:—Take the sacrificed negative—a portrait, for example—and, if dry, soak it for a moment in water; then expose it, the gelatine film on top, to a source of heat—in the sun, for example. The gelatine melting under the action of the heat makes it slide skilfully in any direction of the negative by giving it the proper inclination. You will uow see the uose of the patient become longer or shorter at the will of the operator, and the rest of the face will take on very strange expressions. A practised hand will chauge a profile into a crescent, and a full face into a full moon. This artistic operation properly done, dry the uegative aud print iu the ordiuary manner. As is seen, the operation is ridiculously simple, and the result positively hideous. We will offer, however, a last recommendation to our readers. Before operating, make sure that you can obtain the assistance of two friends as seconds, in case the subject should happen to see your work.—DIAFRAGME, in *Photo. Gazette*.

## Notes.

Mr. Clayden said last week at the Meteorological Society, that his re-invention of the black mirror devised by Dr. Riggenbach for use in photography for special purposes may have been due to the thoughts of the original inventor, by unconscious cerebration, coming into the world again through his (Mr. Clayden's) head. A good bit of unconscious cerebration seems to have been going on of late years in relation to the old heliochromic process invented by Ducos du Hauron, of taking negatives through glasses of three colours, and then, by photo-mechanical means, printing from each of them with different pigmentary colours, to form one coloured print by superposition. Several instances have occurred in this country. If, when this process and variations thereof are brought before the public as photography in natural colours, the populace believe them not to be pigmentary colours, they are misled.

Most of the rooms in the new premises of the Camera Club are now sufficiently out of the builder's hands to render the establishment a comfortable one, even in its present incomplete state. The large room in which the meetings are held is well adapted to its purpose; at the farther end some of the wall is whitened to give the best class of screen for lantern displays. A new lantern is in course of construction, with lenses for the optical system made upon true principles, and adapted to throw a good image from the extremity of the opposite end of the room to the screen, so that the lantern and its platform may not be in the way of any of the observers. Physical and chemical laboratories are needed in an organisation like the Camera Club to make the establishment complete, for it ought not to be without spectrum cameras, heliostats, and other instruments useful in original research. Had it possessed such, before this Professor Lippmann's experiments would have been repeated within a few days after the news reached this country, and the research been pushed forward in various directions. In Brussels such facilities for photographic and other research are provided for the free use of the public by the Government, and are to be found in the Old Museum in that city.

The Photo-Club of Paris is, in that city, an organisation of the same description as the Camera Club here. This year it began to issue a *bulletin*, and the first two numbers have reached our hands. The president of the Paris Photo-Club is Dr. Dujardin-Beaumetz; the committee of administration, Dr. H. Labonne, president; MM. Maurice Bucquet, secretary general; Paul Bourgeois, librarian; Paul Gers, treasurer; Achille Darnis, Count Desmazières, Henri Guérin, Paul Houdé, Dr. Jouslain, and Emmanuel Mathieu. Its first number contains much about M. Lippmann's discoveries, illustrated; in fact, most of the French photographic journals have given considerable attention to the subject. The Photo-Club of Paris has been established for two years. At one of its meetings M. Demeny, the able co-worker with M. Marey, exhibited to the members the remarkable work which has been done at the physiological establishment in the Park of the Princes, to determine in a precise manner the diverse attitudes of men and animals in motion. The Photo-Club *bulletin* is edited by a committee, and its general appearance is elegant. At a recent meeting of the Photo-Club, on the proposition of M. Delbruck, a member of the Camera Club of London, M. Alvarado, who was shortly to leave for England, was delegated by the committee to take steps for the exchange of publications, and the establishment of relations between the Photo-Club of Paris and the Camera Club. The address of the Photo-Club is 40, Rue des Mathurins, Paris.

We have received from Herr C. Schiendl, of Vienna, a personal attack upon Dr. Eder, containing nothing about photography or photographic history, but charging him with hatred and untruthfulness, and answering nothing contained in the lengthy criticism of Herr Schiendl's book recently published in these pages. We cannot open these columns to such personal attacks. Whatever the general tone of Dr. Eder's criticism may have been, he gave chapter and verse for what he had to say, thereby giving Herr Schiendl the power of refuting him, if inaccurate, by reference to the original text of published historical documents. Herr Schiendl has the right of reply when the reply is one in fact.

The rapidly increasing use of electricity as a light-giver is patent to everybody, and certainly no one is more interested in the exchange of old lamps for new ones than the progressive photographer. We are most of us aware that, under the recently amended electric lighting Act, various companies have been formed for the purpose of supplying different parts of the metropolis with the necessary electrical energy to produce the new light. But it is not so generally known that the Vestry of St. Pancras have, from the beginning, turned a deaf ear to such schemes, and have resolved to keep the game in their own hands. Considering that it is now time to be up and doing, they have arranged to commence an installation which will provide for the south-western portion of the parish, a section which will embrace Tottenham Court Road and other important thoroughfares. They believe, moreover, that in the absence of shareholders they will be able to supply the need at a lower cost than has yet been believed possible.

With a view to make their future clients alive to the advantages of electric illumination, the authorities have organised an exhibition of electrical appliances at the Vestry Hall in St. Pancras Road, which was formally opened by the Lord Mayor and Sheriffs last week. This exhibition, although a small one, is by no means insignificant, and we strongly advise those of our readers who can do so to pay it a visit before it closes at the end of this month. There they will be able to see both arc and incandescent lights in action, besides numerous examples of the manner in which the obedient "fluid," if fluid it can be called, is made to do all kinds of mechanical work. There are here shown many domestic labour-savers in action, such as sewing machines, washers and wringers, boot-cleaning contrivances, and various other things of a similar nature.

---

Such an exhibition as this will make the enterprising photographer dream of the advantages which electricity will presently confer upon him. First and foremost, of course, there is the arc light, which will make him independent of sunbeams. Then he will see how his reception-room can be pleasantly illuminated by incandescent globes of different tints fitted to the most artistic brackets and electroliers. He will also see before him the possibility of using the current in various ways as a motor. His developing dishes will rock automatically, and his washing machine—albeit somewhat different in character to the washers shown at the Exhibition—can be made to work so regularly that every trace of hypo must quickly disappear. There is little doubt that, with the current at hand, the ingenious worker will find out many ways in which it can be made useful in his every-day practice.

---

A photograph was recently published in an American paper which purported to represent a shell in flight, fired from an eight-inch mortar, every part of the landscape being in good focus, with an exposure of 0·0000076 of a second. An expert photographer thereupon wrote to the editor of the paper, and pointed out that, at any time of day, when a shadow as long as that cast by a certain figure in the foreground occurs, with a lens stopped down sufficiently to give such sharp outlines to distant woods, and a shutter speed sufficient to get the ball at all, such a picture is an impossibility, and that nothing more than the faintest outline of the highlights would be developed. Inquiry led to the acknowledgment on the part of the picture producer that he had touched up and intensified that ball. This is an example of cooking a photograph which all honest men will condemn, while they must admire the acumen of the intelligent critic who took the trouble to expose the fraud.

---

The old controversy between the advocates of microphotography and those who believe in making drawings by hand has a good chance of being revived. There was certainly material enough at a recent meeting of the Royal Astronomical Society, to which meeting a reference was made last week. Mr. Mayall's contention is, that certain chemical manipulations may give a false rendering of the microscopic preparation when reproduced by photography. Some workers, for instance, had been led away by the energetic action of powerful reducing agents such as hydroquinone, and induced to aim at producing photo-micrographs of exaggerated contrast, instead of contenting themselves with a simple reproduction. The chairman seemed also inclined to hold this view, for he advanced the opinion that, contrary to a common doctrine, it was quite possible for a photograph to lie. It would almost seem, from the tone of the discussion, that microscopists now-a-days are photographers first and microscopists afterwards, whereas the reverse should be the case. It is a serious matter if it be true, as Mr. Mayall said: "In twenty years hence the student who should examine the Society's collection of photographs would be sorely puzzled to determine what the present generation of photo-micrographers had really been aiming at."

---

A platinum mirror is the latest scientific toy. A platinum mirror has the peculiar property of both transmitting and reflecting light, and this property has been utilised by M. M. Dodé in the following way:—Behind the mirror they place a movable panel or shutter, and between this panel and the glass is placed a picture or photograph. When the panel is shut the picture is invisible, and the person gazing in the glass sees his or her reflection. When the panel is opened the reflection disappears, and the picture or photograph appears. These platinum mirrors may be used for other purposes. Placed in the panels of doors, they will light up a corridor or a gloomy room, and on the other side they form mirrors, so that, standing on the reverse side—that is, the platinised side—one can see through the glass without being seen. Anyone who is curious to try the experiment will find the formula for the preparation of the platinum solution in the last issue of *La Nature*.

---

Collectors of early editions of Dickens have reason to rejoice that photography was not discovered when Pickwick was written. The sale of the work, we are told, so greatly exceeded all expectation that new sets of plates had to be prepared for the successive editions. There was no means, as now, of reproducing the plates by automatic process, so they were copied by hand, and, in copying them, the artist took any liberty he thought proper. Sometimes he left out one detail, such as a lady's bonnet-strings, and sometimes he added another. The different "states," therefore, are most distracting, and one has to be an adept to know the very first at a glance. But this variety it is which gives value to the early editions, and the keenest of pleasures to the enthusiast when he secures a copy. Could the first plates have been photographed, all the exercise and nicety of judgment which the connoisseur likes to display would be lost.

---

We have before written upon the curious resemblance between the portraits of the Oxford and Cambridge boating crews. Every year these sixteen young experts are all photographed; but, for any great difference that exists, the same photographs would do year after year. We are not alone in noting this fact. The *National Observer*, in an article on the race, says: "The illustrated journals will, as usual, give portraits of the members of the crews, printed all from the same negative, with moustaches added to order." This really is no exaggeration.

## PHOTOGRAPHY IN JAPAN.

BY PROF. W. K. BURTON, C.E.

A word or two as to what is going on here, photographically, at the beginning of 1891 may be of some interest. The progress during the three years and a-half that I have lived in the country has certainly been great, yet a mere sketch of it will be enough, as it really amounts almost entirely to the adoption of western methods that are already well known.

The greatest advance has arisen from the general introduction of the dry plate process. Three years ago dry plates were pretty extensively used, but I think no single professional photographer used them exclusively in his studio; many did not use them at all, and the majority used them only in exceptional cases, as when the weather was bad, or restless children had to be photographed. Now collodion is the exception, except with the "tin-typist," of which class there are many, especially at holiday resorts, such as Asakusa. The result of the change is a general all-round improvement in the quality of work that is very marked. A tendency to adopt larger sizes, done direct, is a natural outcome of the change from wet to dry plates.

In printing methods not nearly so much advance has been made. The ordinary albumenised paper is still almost the only medium for prints issued in moderate numbers. This is not from want of appreciation of better methods by the Japanese; the beauties of the platinotype process are fully appreciated, and about a year and a-half ago it seemed likely that the practice of platinum printing would spread; but the sudden and enormous rise in the price of platinum put a stop to the use of the paper, as photographers found they simply could not get the prices they had to charge for prints to make the printing at all remunerative.

The carbon process is worked a little; indeed, it is worked with great success by Maruki, but the total number of prints turned out is but small.

Bromide paper is used to some extent, but only, so far as I know, for enlargements, which do not seem to be much run after. It is likely, however, that the recent action of Mr. S. Cocking, of Yokohama, may bring this paper more prominently before the public. Mr. Cocking presented a large quantity of the paper to the Photographic Society of Japan, and offered three prizes for the three best pictures done on the paper. An exhibition of results will be held toward the end of January, and the prizes will be awarded.

The only thing that is at all "running" silver printing on albumenised paper, at present, is collotype, as worked by Ogawa. Ogawa's best work is as good as any that I have seen, but it is dear for collotype, and, of course, is not applicable unless a considerable number of prints has to be done from the same negative—say fifty at least.

Among the few really active and enthusiastic amateur photographers that we have, printing on silver on various kinds of plain paper or other fabrics, and toning with platinum, is very popular.

Zincography, intaglio, copperplate engraving in half-tone, and various other photo-mechanical processes have been worked out to success on an experimental scale since I have been in the country, but none of them is yet worked commercially.

The only thing I know of that is really new in photography that has originated in Japan, is the photographing in metallic gold on a basis of lacquer, mentioned in my notice of last year's exhibition as the invention of a Yokohama photographer. It is intended to produce the effect of the "gold lacquer" for which Japan is so famous. I passed the house of the inventor the other day, and examined all the samples to be seen at the time, and I must say that some of them—large panels, for example, with designs in gold on black lacquer—appeared to me to be of very high merit from a decorative point of view. I do not know whether any samples of this kind of work have yet reached America, but I should think that it would be popular.

The Photographic Society of Japan must be pronounced a most decided success. Of all the various societies in the country, consisting partly of Japanese, partly of foreigners, it seems to run on the most easily. It would be a much greater success than it is were it better supported by professional photographers, but it must be admitted that the great bulk of professional photographers here take no interest in photography beyond its commercial aspect, and that there is a deal of the meanest kind of jealousy amongst them, so that the fact that a certain professional photographer is a member of the society will be a reason why some half dozen others will refuse to join. Moreover, there are many who are actually inimical to the society, because demonstrations are given at the meetings of processes the secrets of which a certain class of professional photographers would like to see strictly guarded. There is a good deal of the same kind of feeling with regard to the *Shashin Shimpo*, the Japanese *Photographic News*. The fact is that the older hands could only learn the "mystery" of photography by becoming the apprentices of established photographers, often paying the latter for the privilege, and that they look with ill-favour on the giving away gratis of that information which they so dearly bought.

Fewer Japanese have taken to amateur photography than I expected would. We have a good many names of Japanese on the list of the society who must be classed as amateur photographers, but they are mostly men following scientific pursuits, who either take a purely scientific interest in photography, or who use it merely as an aid in their pursuits.

On the other hand, the pursuit of amateur photography is greatly on the increase among the foreign community. I refer here to the permanent foreign community, who are to be clearly distinguished from the "globe-trotting" floating community, of which we now have an extraordinary number at nearly all times of the year.—*The Photographic Times.*

The Permanency of Water-Colours.—Prof. V. Wouwermanse, of Vienna, has made some investigations as to the permanency of water-colours. He painted a number of surfaces of equal area with various water-colours, and divided them into two equal parts; one portion was exposed for two weeks to the sunlight, whilst the other was kept in the dark. Gamboge and Indian-yellow suffered only slight change; yellow ochre, burnt sienna, sepia, and the blues, underwent no change; vermilion, however, lost almost entirely its fire; some vermilion tones became a dirty brownish-violet, and carmine lake, as well as pure carmine, changed to a scarcely perceptible rose. Neutral tint, a mixture of carmine, and pin's-blue took a much bluer tone. As neutral tint mixed with burnt sienna gives a handsome grey, which is much used by retouchers, it is preferable to use, instead of neutral tint, the much more certain indigo-blue.—*Photo. Archiv.*

## Literary Notices.

Evening Work for Amateur Photographers. By T. C. Hepworth, F.C.S. (*Hazell, Watson, & Viney, Ltd., London*, 1890.)

This book is interesting to read at all times, and is likely to be practically useful to the photographer during the season of dark evenings, for it treats of the production and exhibition of lantern slides, the management of the lantern, frame-making and guilding, enlarging, and the electric light in the optical lantern. It is written in an easy narrative style, and exhorts beginners at lantern exhibitions to do likewise, by accompanying the pictures which they throw upon the screen with a suitable descriptive narrative or tale. Often, indeed, have we seen a picture projected upon the screen representing some scene of absorbing interest in legendary lore, and in which a strong interest might have been excited in the minds of the observers had the exhibitor known anything and told something about the scene he was presenting, instead of letting the slide pass with only a name, and nothing more. If photographers, before going on tour, would read up the history of places they are about to visit, their travels would be more interesting to themselves, and, when in the locality, they would know better what to photograph and why they should do so.

Not far from the beginning of Mr. Hepworth's book comes the following useful little item of information about the cutting of gelatine-coated glass plates with glaziers' diamonds :—

> In the case of cutting through a dry plate, it may be cut from either side, but it is best to apply the diamond to the film side. There is more than one reason in favour of this course. If we make our cut on the back—that is, on the glass side of the plate—we are pretty sure to raise a few tiny filaments of glass which may lead to scratching of the film subsequently ; we find, too, that when the cut is made in this manner, and the glass is broken into two halves, it still remains united by a tough hinge of gelatine, which cannot be parted without some effort, and which will often lead to partial stripping of the film. But by cutting through the gelatine in the first instance, this last difficulty cannot arise, and there will be no spicules of glass to cause after-scratches of the film. A difficulty arises in the circumstance that all glaziers' diamonds will not cut through gelatine. Mr. B. J. Edwards tells me that it is his practice to send to the manufacturers for a number of diamonds at a time, and to try them one by one, so as to sort out the minority which will cut through a glass plate on the film side. He tells me that a diamond which will do this, and one which will not, do not differ in appearance in any way, even when subjected to the closest scrutiny. The only way of finding out the right kind is by careful trial, and not by mere examination.

In one part of the book the author deals with the question of inexpensive condensers for enlarging and reducing purposes, and devotes a few pages to the out-of-the-way subject of water-lenses, made by cutting the tops from well-formed glass shades, supporting them horizontally by a wooden or metal ring, then filling with water the glass bowl thus formed. This is one way of getting plano-convex lenses of seven or eight or more inches in diameter. In one of the diagrams he represents one of these water lenses, supported a little above another, so as to form a double-lens condenser ; a plane mirror below, placed at an angle of forty-five degrees, sends the light from the flame upwards through the condenser ; another mirror above the lenses, and at an angle of forty-five degrees, sends the condensed beam of light in a horizontal direction. One obvious defect of this arrangement is that the flame is so far from the lower lens that there must be considerable loss of light, and that any plan of bringing the flame directly underneath the lens would tend to boil the water. In any case, conditions are likely to occur occasionally under which moisture would be deposited on the under surface of the upper water-lens. These crude arrangements seem to be mentioned more as curiosities than anything else ; nevertheless, a little scientific work has sometimes been done with them.

Another subject dealt with in the book is that of clouds in lantern slides, a subject which will attract more and more attention as time passes on, and we near the period when blank skies will no more be tolerated in slides than in paper prints. We think that one of the best ways to get natural clouds is to give two exposures on separate plates, one for the landscape, and one for the clouds ; the combined result is sure to be natural, and the lighting of all parts of the picture true. By the use of suitable shutters, and by special methods of developing, some operators are much more expert than others in securing the landscape and the clouds in the same negative. Mr. Hepworth recommends the use of sky negatives, not necessarily one taken on the spot, and gives practical information how to employ them. He also has something to say about shutters to assist in securing clouds.

Mr. Hepworth deals with the subjects of photographing by the magnesium light, and the employment of the electric light for the optical lantern, and various photographic purposes. In our opinion, the electric light is at present too expensive for practical use, when the cost of maintenance, and all items, are included ; so much so that, except in a few fashionable studios, and in photo-mechanical printing works, it is not likely to be much used in photography, except by those who can afford luxuries.

---

Jahrbuch fur Photographie und Reproductionstechnik fur das Jahr 1891. By Dr. J. M. Eder. (*Halle : W. Knapp.*)

Always welcome is the appearance of Dr. Eder's Year-Book. We can expect with certainty to find in the volume some pieces of new and valuable scientific information from some of the first workers in the several departments of photography ; and the photographic process illustrations are a pleasure to look at and to turn to again and again. There is one point, however, in which the present volume differs somewhat from its predecessors : it contains a large number of reprints from the current journals of the past year, particularly from the English journals. The number of references taken or condensed from our own pages of the past year can only afford us gratification, as showing the interest excited in Germany by the progress which has had to be chronicled amongst ourselves. We do not mean this to be understood in any carping or ironical strain. One of the most useful offices of the photographic *litterateur* is to bring to the notice of his brethren the things which, being printed originally in another language, might escape their observation. There are, moreover, many original articles, some of them evincing great thought and an immense amount of work in their preparation.

Of the original articles we may refer to a few without disparagement to the others. The photo-mechanical processes, which are now so extensively practised in Germany, always receive considerable attention in Dr. Eder's Annual, and this year it opens with an article by Carl Angerer on typographic colour printing. Then we have one on photo-lithography by Adolf Franz, the director of the bank-note printing office in Vienna; one on phototypy, by G. Fritz; on defects in photo-lithographic transfer, by Aug. Albert; the preparation of photo-printing surface on stone, by Jos. Eberle; photo-mechanical colour printing, by F. Jasper; a new method of making artificial substitute for lithographic stone, by Jos. Semling; on improvements in printing photo-lithographic transfers, by Prof. Husnik; notes on printing from flat zinc surfaces, by C. Kampmann; heliographic etching process without the employment of a positive transparency, by Oskar Pustet; half-tone zinc etching, by L. Schrank; the future of collotype, by F. Silas; on line plates for half-tone zinc etching, by Ad. Tuercke; the present condition of photo-mechanical process, by our esteemed contributor, L. Vidal; the nickelling of printing surfaces, by O. Volkmer; the preparation of colours for photochromy, by Dr. W. Zenker—a goodly array of workers in this important field. In other departments we may mention the contributions on optical subjects—G. Fritz, Hugo, Kruss, and Dr. Stolze. The latter writer refers in one of his papers to the discussion on "Naturalistic Focussing" that has taken place during the last twelvemonth in England, and quotes the arguments against large diaphragms and consequent want of sharpness that were then brought forward, giving mathematical calculations to further elucidate them.

Space does not permit us to deal with the many other valuable literary contributions to the "Jahrbuch," but we cannot omit reference to the collection of photographic process illustrations at the end of the work. The first of these, a study of fruit and foliage, is a beautiful specimen of technical excellence in its own kind, and, like the second, is given as the work of scholars at the Imperial and Royal Institute for Instruction and Research in Photography and Reproduction Processes in Vienna. Work like this makes us look longingly for the establishment of the projected Institute of Photography in our own country. Then we have specimens of Moss-type from New York; a photo-zinco process print by Husnik and Haüsler; another specimen, this time of a retouched head, of the work of pupils at the Imperial Institute. Türcke's zinc-etching, with which our readers will be familiar; several illustrations of groups taken by R. Slingsby, of Lincoln; and one of similar character photographed with Hezekiel's flash-lamp. After a photographic print of a stalactite cavern, comes a plate with half a dozen illustrations of a bullet in flight, and the waves of compression and rarefaction of air thereby caused. Other scientific illustrations are, one of a part of the moon's surface, and a particularly interesting one of a window, taken with that minute optical instrument, the eye of a glow-worm. A peculiarity of the insect eye is that objects are not inverted by it, but seen erect. Photo-lithography in half-tone is illustrated by a particularly sunny-looking picture of a building, very much the reverse in appearance of the smudgy-looking things at one time considered passable specimens of photolithographic work. We have next "pupils' work from Cronenberg's Instruction Institute," a beautiful production which any professor might well be content with. A photo-engraving of Heidelberg Castle is a fine, vigorous specimen of its kind, and a good kind too; and a photo-zincograph partly printed in colour, completes a set of illustrations which would make the "Jahrbuch" a desirable acquisition even to those unable to avail themselves of its literary contents.

Beitrage zum Problem des Electrischen Fernsehens. (*R. Ed. Liesegang: Dusseldorf*, 1891.)

This "first volume" of "problems of the present time" is devoted to the consideration of the possibilities of constructing an electrical telescope, and—what would naturally be expected to follow—the photographing of distant objects by means of an electrical current somewhat analogous to that which serves for telephonic purposes. Whatever may be the view of the reader as to the ultimate practicability on the one hand, or the visionary character on the other, of such an idea being ever effectively carried out, the philosophic tone of the work will commend it to readers who appreciate the strife for something ideal at the same time that they require that certain elements of probability should be present. One or two extracts from the preface will give some idea of the tone of the work.

"It would be in many aspects interesting," quotes the author from Carus, "and a worthy task, to write a book in which should be collected the hundreds of instances in which the construction of mechanical apparatus, to the perfection of which our epoch is striving so vehemently, has its origin in the imitation of portions of the animal organisation, and how, now recognised and now unrecognised, the image of man and of the animals has served as a model for innumerable tools and appliances which, in our every-day life, are of indispensable use.

"Kapp has written such a book. In his basis of a philosophy of technics, he shows that almost all tools, machines, and so forth are unrecognised imitations of some portion of man. The hammer is a lengthened fist, pincers are a grasping hand, or a biting pair of jaws. The achromatic lens is an imitation of the crystalline lens of the eye; the camera of the photographer, the complete eye; musical instruments, such as the harp and the piano, the internal ear; the organ, the voice; the arrangement of the bones, the model of certain architectural work; and the telegraphic current is analogous to that of the nerves."

The author, a son of Dr. E. Liesegang, is a worker who has made an important advance towards the solution of the problem which he attacks, and the present condition of which he fully sets out.

Der Entwicklungsdruck auf Gelatine Emulsions: Papier und die Vergrosserung direct nach dem Negativ. By G. Mercator. (*Dusseldorf: E. Liesegang's Verlag.*)

When any department of photography becomes so extensively worked as to warrant a literature of its own, we should be surprised if the house of Liesegang were without a work dealing particularly with the subject. The process of printing upon gelatino-bromide paper has, indeed—especially in connection with making enlargements—come into such extensive use as to justify the publication of a book such as the present, a book which, in its hundred and odd pages, illustrated with twenty-eight wood-cuts, contains all that can reasonably be required in the way of information to an amateur or professional photographer who desires to make his own enlargements by the bromide process.

## PHOTOGRAPHIC CHEMISTRY.

### III.

Last Monday night Professor Meldola delivered his third and last lecture on the above subject at the Society of Arts.

The speaker stated that when light falls on silver bromide or silver chloride it darkens in colour, and gives off gas which acts upon paper prepared with potassium iodide and starch; in these cases it is evident that chemical decomposition has taken place, but silver iodide does not undergo decomposition under like circumstances except in the presence of an iodine absorbent.

When the silver haloids, free from nitrate, are spread upon paper, different substances can be applied to the paper with them, which substances act either as accelerators or retarders; reducing agents accelerate, and oxidising agents retard or stop the action of light altogether. Sodium nitrate is sometimes an oxidising and sometimes a reducing agent; when applied to a silver haloid it acts as a reducer. Sodium sulphite is also a reducing agent. Silver nitrate is usually considered to be an oxidising agent, but in this case it is a reducing agent because it acts as a halogen absorbent. Mercuric chloride is an oxidising agent and a retarder, so also is a solution of bichromate of potash.

In all cases in which a visible image is formed there has been photo-chemical decomposition, but in the example of an ordinary plate in the camera, the exposure is too short to permit the formation of a visible image, and the question arises whether the action is the same in both cases. He was personally inclined to think that the deposits are the same in both cases; still, in the way of direct proof, there is a gap, and the conclusion cannot be treated as an established fact; in relation to this matter our knowledge is in the same state as it is in relation to the coloured products dealt with in the previous lecture.

As regards the darkened products, there is proof that they contain a little less chlorine than the unaltered silver haloids, but they are not definite chemical compounds; they contain also a great excess of unaltered haloid; they are a mixture of silver haloids with unstable coloured products of photo-chemical decomposition. These coloured solid products may be compared, though it may seem strange to do so, to saturated solutions. Dr. Otto Witt is also of this opinion.

After this saturating point is reached, light produces no additional effect unless a reducing agent be present to absorb the halogen as fast as it is liberated. For instance, if silver chloride be put in a tube, and submitted to the action of light, while moist hydrogen is passed over it, and that hydrogen be then made to bubble through silver nitrate, in the latter solution a precipitate of silver chloride will fall, and much more than if air had been used instead of hydrogen. This experiment was originally devised by Robert Hunt.

The dark deposit in the case of chloride of silver is certainly not metallic silver, for it can be formed in the light while the chloride is under nitric acid. Whether the deposits contain oxygen is a problem demanding additional research.

The speaker, after showing a few experiments to prove that water in contact with silver haloids acts as a weak sensitiser, said that silver chloride will darken in a high vacuum, but when the bulb is taken into the dark, the deposit in its interior soon absorbs the chlorine again, as Mr. Crookes has experimentally proved. He next spoke of the chemical and physical theories of the latent image, and argued that the probabilities are in favour of the former being the true one. He incidentally mentioned that Dr. Hurter does not hold this view.

As regards the ripening af emulsions, he said that some experiments he was making tend to show that some amount of chemical reaction is set up between the silver haloid and the gelatine. In investigating the problem, less attention should be given to the state of molecular aggregation of the haloid, and more to the sensitive substance formed, upon which a developable image is afterwards produced.

A very slow reducer acting upon a photographic film for a short time has the same effect upon it as a short exposure to light, and can be made to form a developable image. Glucose, with a little alkali, is a feeble reducing agent, and can be used for this purpose. That the kind of pressure called "shearing stress" will do the same was first revealed by Carey Lea, but, by pressure, the lecturer had been unable to make developable images upon any of the pure haloids; it was necessary that some foreign substance should be present to act as a sensitiser. Mr. Spring, of Liége, has proved that by sufficient pressure chemical reactions can be set up; so in the case of an invisible image produced on a gelatine plate by shearing stress, it is probable that the pressure has produced a chemical effect.

The Chairman, Mr. Francis Cobb, moved a vote of thanks to Professor Meldola for his three lectures, and said that it is his personal opinion that the invisible image is not of a physical nature.

Last week, in our summary of Professor Meldola's second lecture, we, by an obvious slip, described corrosive sublimate as mercuric oxide instead of mercuric chloride. When the full text of Professor Meldola's utterances on the invisible image is published, we may make some criticisms thereupon.

## PICTORIAL COMPOSITION.*

BY P. H. NEWMAN.

The successful application of light and shade is but a poor achievement if unaccompanied by sentiment, although the flat surface of the picture be entirely overcome. We demand the magic influence of mid-day, sparkling in abrupt transitions; the mingling shades of dawn and twilight; by the powerful influence of light and shade we crouch at the storm and shiver in the breeze; its poetical influence is independent of subject. In proportion as a subject is poor, compensation must be made by the interest given to the sky. It is the sky which unites the several parts of a landscape into one harmonious whole—it enriches poverty by supplying new forms, or by affording contrast to those which the subject itself possesses. It is to the sky that the landscape painter must look as the great source of pictorial effect worth his recording. Varying for ever in form and colour, its fitful changes are communicated to the landscape—now obscure, now bright. *Terra firma* may, indeed, afford a good subject; but from cloudland we must derive impressive sentiments. Often when the student has roamed far and wide in search of something "worthy of his pencil," he would have done better to have remained at home, and besides looking to the earth for subjects, have looked upwards to the sky for sentiments in which to clothe them. Without sentiment the painter of landscape would make his mountains high, but not inaccessible to all but thought; large, but not immense; his gulfs might be deep, but they would not be profound or terrible; he might paint a storm or a shipwreck, but he would to fail suggest "the remorseless dash of the

* Concluded from page 231.

billows," the "rushing mighty wind," or the "live thunder" from the dark cloud where "Tempest sits enthroned."

Now, will somebody say, "All you have told us is very good, and distinctly applicable to the arts of painting, but why fetter another form of art with all these restrictions and narrowness of scope? For if it cannot give all the manifold charms you and Harding desire without so much pains and abnegation, yet photography gives the world something that the most elaborate art has never given. Does it not give detail and accuracy of drawing that was never observed before, unless it be in the microscope? The camera may be called the microscope of the field." Verily this is so, and in that sense I would be the very last to fetter photography; it is an invaluable sense; but it must be remembered that this is a scientific sense, and not an artistic one. I am talking of pictorial composition—the science, if you will, of fine art. Harding says, "Individuality or identical imitation is not only absolutely impossible, but is not required; for, otherwise, to perfect the charms of sculpture or painting, we must add colour to the one, and rotundity to the other. Were identical imitation necessary, we could not stop short of any of the attributes of reality."

I have already said I have nothing new to tell you, and as I have already notified your Society that better than my own teaching would be, at this lecture, to give other people's ideas, I shall make no excuse for quoting now from an essay on "Imitation in the Fine Arts," by Qatremère de Quincy. He says: "Do we remark that there is matter in the masterpieces of sculpture? Do we wish for the addition of colour; or the step nearer to verisimilitude which it might bring? Do we, in paintings, regret that the beautiful scenes are presented to us only on one side, or that their figures are motionless? What, then, would we have? Are shrieks wanting to the torments of the Laocoön, or the accents of lamentation to the anguish of Niobe? It will hold good as a general remark that, according as the imagination is more active, we possess in a higher degree the necessary capability of supplying the kind of deficit common to every work of art, and the better, also, are we contented with the specific illusion. In fact, the pleasure of illusion arises, more than we allow for, from a sort of working of the mind, by which itself finishes the work of art.

"In imitation which is limited to the senses in the choice of its subjects and its mode of representing them, it may fairly be asked what its images can teach me, restricted as they are to the gratification of the eye? What do they show me more than I already know? What do they put me in a position to receive over and above their model? What impressions depending on art do they communicate? What new acquisition can such imitation promise me or give me reason to hope for? It does not carry my imagination beyond the confines of reality.

"I shall be told it gives me what nature—whose portraiture it is—gives me. I answer, no! It does not give it precisely, because it is only a portrait, and because a portrait is only a part of the resemblance of the natural object, and presents only a single aspect. Wherefore should I wish for a copy? What need have I of the appearance of things whose reality I am indifferent to? What worth can I attach to the image when I hold its model in contempt, more especially since there is nothing beyond to compensate for the absence of all those properties which nature denies me?"

It seems almost needless for me to add that he means that which a picture often supplies, but unassisted nature rarely.

We might carry this further, and, indeed, its application, I am sure, comes home to everybody in this room when they think of past suffering. What weariness has overcome them while contemplating an album—nay, how one almost shudders at the word—and what tortures have been endured in visiting the local photographer and inspecting his views, those deadliest of dead seas, and his none the less veracious valleys—valleys of the dry bones of nature without a scintilla of art in their bald presentment to redeem them; irredeemable, indeed, and hopeless, because matter without spirit is, and must be, hopeless.

What this spirit is that may redeem, irradiate, and warm the bleakest landscape, I have endeavoured to put before you this evening, not in my own feeble language, but from the text of another, who, in his turn, has learnt and compiled from the teaching of the past. I have told you nothing new; he has told you nothing new; art is the next oldest thing, perhaps, to the hills, and its canons are the outcome of the very nature of things, and as irrevocable. Nothing is more talked about to-day, and of nothing is there less to say; it cannot be taught, it may be learnt; it is much more likely to be felt after long, patient years of study, felt imperceptibly at first, than in a flash and in full revelation. Perhaps a picture, perhaps a dream, a sonnet, or a sympathetic voice, or a swell of mighty music—who can say; it will depend on your idiosyncrasy when and how you are capable of analysing that which to the multitude is beyond analysis.

What have I told you? Pictorial composition is the art of putting picturesque things in a picturesque way—that is, not putting them absolutely side by side, or immediately one on top of the other, nor at equal distances, nor four square, nor putting the least important thing in the most important place; if you can do this, and can arrange the lighting to get contrast without patchwork or spottiness, and obtain a breadth of effect conducive to the prominence of your principal object, you will be carrying out in photography what is aimed at in painting; and, while satisfying yourself and your beholders, you will be doing much to lessen the flood of bad photographs that are giving your ignorant brethren the basest ideas of art, and doing not a little to lift it out of the mire to its proper place again.

In art, as in all things, history repeats itself. The refined æstheticism of ancient Greece was debased by the Roman architects, and even Greek artists of the late imperial times were employed, and prostituted their glorious traditions by travestying them in the luxurious villas of Herculaneum and Pompeii. It required that art should die and be born again in the last throes of the empire at Byzantine, and be inspired by a new faith and a northern fervour in the Gothic periods, before it was fit to be married to the sleeping beauty of the centuries, the bride of the Renaissance, who, bringing in her train and as her dowry the new learning, the perfumed breath of the garden of the intellect, the Greek and Latin classics, to add the graces of refinement to the life of the fifteenth century. This marriage we know was fruitful in an abundant family of great names—masters in every form of art, and whose works remain to us now, for the most part unrivalled. Then, within a century or two, this mighty offspring we see dies down, and art appears again to be entering a chrysalis state, as taste declines in the times of the later Louis of France, and assumes utterly monstrous forms in the Rococco and our Georgian periods.

Who, then, shall wonder that in these days art has to make enormous struggles, and, half blinded by what she has passed through, her true path is not distinctly traced before her? Who shall wonder if sometimes she staggers with uncertain step and lifts up an uncertain voice? Who shall wonder at her calls for æstheticism on the one hand, or her clutches at realism on the other? None. No! we should rather wonder and be thankful, in a materialistic age, that she is alive at all; and let us, trusting to those clear lights that have burnt for our guidance through the ages, do what we can to assist art to take her stately way again, and keep its even tenor.

To do this as it behoves us to do, unless we would be branded by posterity and puerility, and stigmatised as blind guides, if we pretend to make pictures, or play with art in any way, it should be in no careless and selfish spirit, but for the ennoblement of the race. Pictorial composition is a great power to this end; and if, at the risk of weariness, I am earnest in pressing upon you the importance of its study and comprehension, it is, gentlemen, because I feel and know its eternal truths will, as they should be, be paramount when those passing fancies whose experiments, as futile as they are frivolous, have passed away.

---

Still More Like Him.—Photographer—"Your son, the student, ordered this likeness from me." "It is certainly very much like him. Has he paid for it?" "Not yet." "That is still more like him."—*Fliegende Blatter.*

# Patent Intelligence.

### Specifications Published.

4,704. *March 26th*, 1890.—"Cameras for Photographing Objects in Motion." Frederick Henry Varley, 82, Newington Green Road, London, Civil Engineer.

My invention consists in a special method of employing drums or spools for paying out the sensitised paper or film, and in gearing the spring work which gives the initial revolutions to the spool to another drum for winding up the film so that the tension upon the paying out spool and the winding up drum are equal or nearly so, and in the use of an adjustable displacement lever, which removes the exposed surface of the film and sets the apparatus for taking the next picture; also the employment of a frame or hollow screen in front of the sensitised film pierced with one or more holes for the purpose of correctly registering each picture.

3,718. *March 8th*, 1890.—"Photographic Studios." Richard Williams Thomas, 121, Cheapside, London, Artist.

My improved portable artificial light studio is composed of adjustable rods carrying white canvas, or other sides or walls, and, when erected, such sides or walls are fixed at desired angles whereby the artificial flash or other light is thrown on to the wall or side immediatley facing the lamp, and thence reflected on to the other walls or sides of the studio, whereby the sitter is reproduced in the photograph without shadows or similar defects usual in taking artificial light photographs.

I employ a number of metal upright rods (usually five) fitted with necessary feet, or stands, and capable of extension to desired height. The top of each upright rod is formed to receive the ends of other rods of similar thickness and of the desired length, which extend from one upright rod to another, so that when fixed they form the framework of the studio; the lengths of these rods are so arranged that the front, or entrance, of the studio is narrower than the sides and back, the back and sides being arranged at suitable angles.

Suspended from the top rods to the whole of one side, and part of the other side, are stretched sheets of canvas or other white material, a suitable background being provided for the back.

The entrance to the studio is supplied with looped curtains or other suitable arrangement. At the back of the said stretched sheets, I suspend from the said upper rods curtains of any dark material for the purpose of resisting the penetration of light.

At one side of the studio, near the entrance, I erect a lamp for burning methylated spirit or similar liquid, this lamp being erected upon an adjustable stand for the purpose of regulating the height desired.

This lamp is placed at that portion of the side of the studio which is not supplied with the stretched sheeting, and it is surrounded at the back by a similar curtain or material, with which I enclose the sheeting round the studio, the space being provided for the lamp by means of another upright rod with necessary top adjustments.

Suspended from the upper rod in front of the lamp, I place muslin or similar material as a continuation of the sheeting at that point. The lamp itself is supplied with a cavity for holding the magnesium powder or other substance used for producing the flash or other light similar to lamps now in use for that purpose. Connected with this cavity is a tube extending to any desired place, and the end of this tube is attached to an air-pump or bellows, or similar contrivance for the storage of air, so arranged that the operator can, by hand or otherwise, regulate the pressure of the air through the tube, and, by this means, slowly force the magnesium powder into the flame of the lamp, securing a longer duration of light than obtained by the ordinary artificial flash process; or he can, by quicker pressure, by the same means obtain an instantaneous flash.

By means of the arrangement of angles I employ for the erection of my said studio, the light strikes the sheeting immediately facing the lamp, and thence to the background and across to the opposite side of the studio, the sitter being surrounded by light without seeing the lamp or having the inconvenience of the flash direct upon him. The casing of the lamp is so arranged as to carry off in any desired direction the smoke and heat necessarily arising from the use of the magnesium powder or similar material.

The use of the said stretched sheeting at the proper angles, and the position in which I place the lamp for artificial light photography, enables photographs to be taken by electric or other artificial light, with much shorter exposure than by the ordinary artificial means, in consequence of the intensification of the light by the reflection produced from one side of my improved studio to the other.

6,239. *April 24th*, 1890.—"Ascertaining the Distance of any Object for Photographic Purposes." Henry Mitchell Hastings, 54, Edith Road, West Kensington, Fulham, London, Analytical Chemist.

The special purpose of this apparatus is to ascertain correctly the exact distance of the object, so as to be able to adjust the lenses of cameras where the image cannot be viewed on the ground glass. I employ a lens of suitable focus fixed at one end of a telescopic body in such a way that the image of the object required is thrown on a disc of ground glass or other suitable material fixed within the telescopic body itself, such image being viewed through an adjustable focussing eye-piece, placed at the opposite end of the telescopic body to that carrying the lens which throws the image; the focussing of this image to be obtained by rack and pinion, or other suitable means, such distance being registered on a scale attached.

As an alternate method, an apparatus may be made of the ordinary telescope, opera, or field glass type, provided with sufficient length of draw, and with a scale showing the different distances. In this case the object is viewed direct, the intervention of the disc of ground glass not being necessary.

# Correspondence.

### SHOWING CELLULOID FILMS IN THE LANTERN.

Sir,—I have found the following plan answer for showing celluloid films in the lantern. Fasten two cover glasses together along one side by a slip of silk about ½-inch wide. They will now open and shut like a book. Shut the film to be shown between them, and place in the slide carrier. By having two of these a film can be placed in each alternately, so as to cause no delay while exhibiting.

I find that, using the oxycalcium jet, I can show film slides six to eight feet across on the screen; above that size they will not allow enough light to pass. I may add that I find coaguline the best thing for holding the silk to the glass.

H. G. M. Conybeare.

*The Hut, Ingatestone, 23rd March.*

### THE NATIONAL PHOTOGRAPHIC EXHIBITION.

Sir,—Arrangements are being made with a view to facilitate the transmission of Liverpool exhibits to us, by sending a representative to sort and overlook the pictures entered here, and to see to their speedy dispatch.

We have already the promise of a great number of exhibits from Livepool, including the wonderful flash-light pictures by the Countess Loredana de Porto Bonin.

S. G. Buchanan Wollaston.

*Crystal Palace Co., Crystal Palace, S.E., March 24th.*

Cementing Glass or Porcelain to Metals.—A method for uniting glass and porcelain with the metals, for scientific and experimental apparatus, has been brought before the Société de Physique by M. Cailletet. He slightly heats the end of a glass tube, for instance, and platinises it by brushing it over with neutral chloride of platinum mixed with essential oil of camomile. On the vapour of the latter passing off, the end of the tube is brought to a dull red-heat, when it is found to be coated with a thin layer of platinum, suitable for receiving a ring of copper by electro-deposit. All the metals capable of being soldered by tin may then be united to the tube, the union being so perfect as to stand a pressure of 300 atmospheres,

# Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting of this Society held on the 24th inst., the chair was taken by Mr. W. Bedford.

Two volumes of *Excursions Daguerrennes*, published in the years 1841 and 1842, and containing engravings drawn from Daguerreotype pictures, were shown by Messrs. G. Houghton and Sons, together with a catalogue of Daguerreotype goods issued by their firm in 1841.

Mr. Chapman Jones introduced "Hand-Cameras"—the subject of the evening—by describing the Memorandum Camera, an apparatus made for plates of $3\frac{1}{4}$ by $2\frac{1}{8}$; that being a size which would give an oblong picture in the circle of a lantern plate. He always used a finder, and preferred to have a loose one, so that it could be applied to the top of the camera, whether it was placed in a vertical or a horizontal position.

Mr. Leon Warnerke showed several hand-cameras. The first was one which had been made some time since for him in Moscow. A mirror between the lens and plate served as a finder. He also showed a French camera made of metal and very light. The front of the camera was of hemispherical form, and in this hemisphere the shutter partly revolved. The dark slides were exceedingly well made. He also showed a German made camera furnished with roller slide for paper or films. The end of one of the spools was continued to the outside, where it bore a brass plate having spiral convolutions. An indicator worked in these convolutions, which were so arranged that, whether the spool was full or nearly empty, the same length of film would be wound off.

Mr. Biden thought it would be desirable to know the price of the camera.

Mr. Warnerke replied that it was very cheap considering its effectiveness, about thirty or thirty-five shillings of our money.

Messrs. Mawson and Swan showed a "Reflex Camera." The chief novelty was stated to be the mirror, which, set between the lens and plate, reflected an image on to a ground glass on the top, and served for focussing and finding.

"Kodaks" of various sizes were sent by the Eastman Company, furnished with lenses of foci ranging from $2\frac{5}{16}$ up to $8\frac{1}{2}$ inches.

Messrs. Houghton & Sons showed the "Automatic Hand-Camera." The apparatus was furnished with a Thornton-Pickard shutter and the usual finders. A novelty was the way in which the plate was brought from the store chamber in the back of the camera under the middle to the front, by way of a shallow well, so that that the depth of the camera was only increased by about three-quarters of an inch. This was spoken about by the chairman and Mr. W. E. Debenham.

Messrs. Robinson & Sons showed photographs taken by the "Luzo Camera" of various sizes, and explained the working of the instrument.

Messrs. Griffiths & Sons showed a "Dines' Camera," in which there was a changing box for a dozen plates at the back, and an arrangement by which these plates could be brought out, one at a time, from any particular groove that might be desired, so that plates of different sensitiveness could be used if required. The changing box at the back could be removed, and replaced by another in full light.

The Zodiac camera was exhibited by Messrs. Griffiths.

Mr. E. W. Parfitt showed the Quadrant camera, the combined invention of Mr. Hume and himself. Each plate was contained in a sheath, and the object of the construction was to diminish bulk as much as possible.

Messrs. Marion exhibited the Radial camera. This was another contrivance for drawing plates from a store at the back—arranged in radiating grooves—to their position at the focus of the lens. The grooves were made of metal electrically deposited, and the plates worked very smoothly in them.

Messrs. Adams showed two cameras, the Ideal and the Adams. It was especially pointed out that there were no projecting knobs.

A hand-camera called the "Photographic Repeater" was shown by Mr. Cusworth. Each plate was attached to a thin piece of wood by a rubber band stretched over either end.

Messrs. Parker and Co. showed their "Companion Camera." They claimed for this instrument great simplicity in the manner of shifting the plates.

Mr. Shew showed a camera which, although for whole-plate, could be worked in the hand. The novelty which had been introduced into it since last shown was the method of focussing. There was a jacket attached to the front board, into which any lens might be screwed. Springing from the side of this jacket, and lying on the front board, was an arm which, by moving round, brought the lens nearer to or farther from the plate. A scale on the board might be marked, to correspond to the various distances at which objects would be in focus.

Mr. Samuel spoke of the various characteristics and requirements of hand-cameras. He held particularly that—as had been pointed out by Mr. Debenham—there should be a means of raising the lens in both positions, and showed how this was accomplished by the U-piece which he adopted.

Mr. Warnerke mentioned the experiments of Professor Lippmann, and said that up to the present he had not succeeded in getting like results, but he had some results which he showed. He had noticed strong iridescent colours in plates made by the dusting-on process with graphite. By rubbing graphite on to glass or ebonite and coating with collodion, he could produce these colours at will. He had prepared a colour screen with strips of glass of various colours, and found that a piece of albumen paper exposed under this screen, and floating on mercury with the albumen side downwards, took colours corresponding, though not so bright, with the colours of the screen. With glass coated with sensitised albumen, however, only darkening took place, and no specific colouration.

Mr. Debenham said that this experiment, in which the colour showed quite through the thickness of the albumen paper, and was the same by reflection as transmission, seemed to be rather following Becquerel than Lippmann.

Votes of thanks to those who had sent objects for consideration, closed the meeting, which was kept up to an unusually late hour.

THE CAMERA CLUB.

The Camera Club commenced photographic meetings in the large room of its new premises on Monday, March 16th, with a lantern exhibition. Sir George R. Prescott presided, and opened the proceedings with a few remarks on the state of the premises and the progress of the Club. About seventy members were present.

A large number of slides was passed through the lantern; the pictures were the work of Messrs. Wellington, Cembrano, Stevens, Sands, Barton, and Chang.

On Thursday, March 19th, a paper on "English Church Architecture" was read by Rev. T. Perkins, M.A.; Major J. Fortune Nott occupied the chair.

The Hon. Sec. drew attention to a notice from the Meteorological Society, and handed round a trimming board, devised specially to ensure certainty in securing parallelism of the horizon with the top and bottom edge of the print trimmed.

Mr. Perkins began by apologising for any shortcomings in his paper, and gave as one reason that he had had to take part with one other person in a ceremony in an ecclesiastical building of modern date. In photographing the interiors of churches, he said, it is astonishing how people can walk about in the field of view without affecting images due to long exposures. On one occasion, however, the head and no body of a friend of his appeared in a photograph, due, he thought probable, to a gleam of sunlight falling on his face for a moment. As some interest had been expressed after his last lecture about the few remains of churches built before the Norman conquest, he had since been photographing some of them, especially in Northamptonshire, which is rich in Saxon remains; in fact, the geographical distribution of churches in these islands is not without interest, because of the light it throws upon the history of this country He preferred the word "Danish" to "Saxon." He then ve some interesting information about pre-Norman churches Bradford-on-Avon, Dover Castle, and elsewhere, gave interesting information about ecclesiastical architecture and its anges, and condemned the flamboyant style. He said that uch useful work in connection with ecclesiastical architecture n be done by photography; but it must be done at once, for e restoring fiend is at work. His suggestion was, that a imber of the members of the Camera Club should band gether, each to photograph objects of interest in his own ighbourhood, reproduce them as lantern slides, and send em in to the Club to be architecturally classified. He then ojected on the screen a number of his pictures of churches.

The subject on Thursday, April 2nd, will be, "Norway as a hotographic Field," by Mr. H. Sturmey.

### The South London Photographic Society.

*Friday, March 20th.*—Hanover Hall was well filled to hear r. Gambier Bolton, F.Z.S., lecture on "Animal Photoaphy." About 100 slides of a high class were exhibited; the ints of the different animals were well brought out. While e lecture was well adapted to a mixed audience, the photoaphic side was not lost sight of, some valuable advice and struction being given about photographing animals.

### The London and Provincial Photographic Association.

*March 20th.*—Mr. E. P. Everitt in the chair. Mr. F. romley Smith was elected a member of the Association.

Messrs. T. E. Freshwater, W. E. Debenham, and R. P. rage were elected as delegates to attend the meeting on the bject of the federatiou of the Londou and suburban photoaphic societies.

Mr. J. Howson, of the Ilford Co., exhibited a series of ints ou Alpha paper, drawing attention to the importance of e tone of the print being in harmony with the subject, and nveying in some degree the aspect under which the picture s taken. He then procceded to give a demonstration of the velopment of Alpha paper, which, he said, was capable of elding a wide range of tones, according to manipulatiou, or e toning bath used. Some prints that had previously been posed were then developed with ferrous oxalate—one part of weak solution of iron to three of oxalate, well restrained, ing used. The prints were immersed, without washing, in the earing solution, consisting of :—

| | |
|---|---|
| Water ... ... ... ... ... | 80 ounces |
| Sulphuric acid ... ... ... ... | ½ ounce |

ter washing iu several changes of water, the prints were insferred to a combined toning and fixing bath—

| | |
|---|---|
| Hypo ... ... ... ... ... | 2½ ounces |
| Acetate of soda... ... ... ... | ½ ounce |
| Sulpho-cyanide of ammonium ... ... | ¼ ,, |
| Chloride of gold... ... ... ... | 4 grains |
| Water ... ... ... ... ... | 10 ounces |

is bath has the effect of causing the prints, when first mersed, to change to a yellow colour and lose vigour. This ultimately regained, and toning is complete in about uarter of an hour. Mr. Howson showed a frame of six transrencies that had received exposures ranging from one-anduarter minutes up to three minutes. The plates were, after posure, each cut into four parts. Two of the parts of each te were simply fixed after development, the remaining two re toned—the object being to show that by judicious judgent with regard to the developer and toning baths, a similar sult could be obtained with a wide latitude of exposure. plying to various questions from the members, Mr. Howson d prints on Alpha paper could be developed with hydrokinone th advantage, but he would give preference to ferrous alate. The best results were from the use of an old veloper freshened with a proportion of new just before use. ints should not be allowed to remain too long in the acid th, as it had a tendency to reduce the image. In this pect the bath would be found useful as a means of corctiug over-exposed prints. The exposure recommended was out two-and-a-half minutes at a distauce of six inches from a batswing gas burner. The distance from the light for larger sized prints should be increased in order to get uniformity of illumination.

During the progress of touing, Mr Howson tore off portions of one of the prints at intervals, that comparisons of colour might be made at different stages of touing.

It was claimed that a better result could be obtained on this paper with a thin negative than with ordinary albumenised paper.

The Chairman asked if spottiness were due to the emulsion.

Mr. Howson said not. It would be more likely due to age, or from the paper being kept in a damp place.

### The West London Photographic Society.

*Friday, March 20th.*—Mr. Brown in the chair.

Letters and papers from Mr. Biden on the subject of the federation scheme were read, and remarks made by the president, followed by a long discussion; after which it was resolved to send delegates to the meeting on the 23rd inst., with discretionary powers.

Mr. C. Whiting then read his paper, repeated by special desire, on "Lantern Slide Making by the Wet Collodion Process." The paper was followed by a practical demonstration. One exposure was made by reduction in the camera, and two by contact. The processes of coating the plates, sensitising, exposure, development, intensifying, fixing, and toning were followed with great interest, and questions were put, and answered by Mr. Whiting, who subsequeutly explained the method of printing-in clouds.

The President then, iu the name of the Society, presented the late honorary secretary, Mr. John A. Hodges, with a lens (by Messrs. Taylor and Hobson, with an iris diaphragm) and a suitable inscription. He made some flattering remarks on past services to the Society by Mr. Hodges, who warmly thanked the Society.

### The Brixton and Clapham Camera Club.

The secoud annual meeting was held on the 19th inst., when a satisfactory report and balauce sheet was presented. The officers for the ensuing year were elected as follows :—*President*—Mr. A. R. Dresser; *Vice-President*—Mr. J. Reyuolds, M.D., F.R.G.S.; *Committee*—Messrs. T. J. Bartrop, W. Bevins, J. W. Coade, M. O. Forster, F. W. Kent, and F. W. Maile.

The occasion was thought to be an appropriate one for presenting to the secretary a whole-plate camera subscribed for by the members as a mark of their appreciation of his services.

The next meeting will be held at Gresham Hall, Brixton, on April 9th, when Mr. Bevins will read a paper on "Light," with lantern experiments.

### The North Middlesex Photographic Society.

The anuual dinner was held at Beale's Restaurant on March 21st, the President, Mr G. Humphries, F.S.A., in the chair.

After the various toasts had been duly responded to, the President presented to Mr. G. R. Martin, the late secretary, a handsome microscope suitable for micro-photography, the gift of the members, and added to it, as a mark of his personal esteem, a high power objective to complete the instrument.

Mr. Martin, in acknowledging the gift, said that the friendly appreciation of his work accorded to him by the members had been ample reward.

The President then presented to the following gentlemen the certificates awarded to them by the judges, Messrs. J. Gale and Ralph Robinson, for work shown at the late exhibition :—Silver Prints—(First) G. C. S. Mummery, (Second) W. S. Goodhew; Platinum and Bromide—(First) F. W. Cox, (Second) W. S. Goodhew; *Genré* (First and Second) W. S. Goodhew; Portraiture—(First) E. S. Hiscock, (Second) F. Cherry; Enlargements—(First) C. Beadle, (Second) W. Taylor; Lantern Slides—(First) W. Taylor, (Second) E. S. Hiscock.

The evening was genially passed with music and song.

On March 23rd, Mr. H. Smith in the chair, a lantern slide exhibition was held. A collection of slides lent by Messrs. Mawson and Swau was first passed through the lantern, and then the following members exhibited their work: Messrs. Wall, Mummery, Cox, Smith, Chaug, Marchant, Ainsley, and Gill. The slides comprised snow scenes, forest glades, woodland nooks, and silent pools, mountain glens, pastoral scenes with the cattle knee deep in the long bush grass, the quays and bridges of busy seaports, barges with towering sails gliding placidly along the sedgy broads, solemn minster aisles, and the excited throng of the race-course, the bustle of city life alternated with quiet home scenes and sleepy villages.

The Croydon Microscopical and Natural History Club (Photographic Section).

*March 20th* was a lantern night, when Mr. Edward Lovett presided, and 200 slides were put through the lantern, the work of members, viz.:—Messrs. Baldock, A. H. Allen (animal studies), Coldwells, J. A. Carter, Mariott, C. F. Oakley, W. Goode, A. W. Hurst, A. S. Wild, and W. Low Sarjeant. Messrs. Carter and Mariott showed some slides of the recent severe snowfall, and Mr. F. C. Oakley also put on the screen some photo-micrographs of rock sections taken by polarised light.

The next ordinary meeting will be held in the old school of art room on April 3rd, when Mr. A. R. Dresser will read a paper entitled, "The After Part of Hand-Camera Negatives" (illustrated).

The Enfield Camera Club.

The ordinary meeting of the Enfield Camera Club was held on Wednesday eveuing, the 18th inst.

Dr. F. Cresswell showed the capabilities of the process unfortunately called "kallitype" to a large number of members. The demonstratiou, which was an exhaustive one—some dozens of prints were developed—was a full explanation of the principles of production given.

Mr. Otto Schölzig sent samples of Dr. Jacoby's chloride of silver emulsion paper.

Four uew members were elected, and it was resolved that two delegates from the Club should attend the adjourned meeting for the proposed federation of London photographic societies.

The Richmond Amateur Photographic Society.

*March 26th.*—Mr. Ennis in the chair.

Mr. Ardaseer iutroduced the subject of "Development and Developers." He touched upon the theory of the action of light upon the sensitive surface and the development of the latent image; noticed the different action in the development of wet and dry plates; explained the functions of the various ingredients employed in development; and enlarged upon the advantages of slow development, of re-development in certain cases, and of the judicious use of certaiu dodges, such as the use of the brush, intentional fogging, and intentional staining, and others.

Mr. Cembrano mentioned that, in cases of under-exposure, he had used with advautage re-development with hydroquinoue after eikonogen, the latter giving detail, the former density.

The Photographic Club.—On April 1st, the adjourned discussiou on shutters. The Bank Holiday outing will be to Leigh, near Southend; members meet at the booking office, L. T. & S. Railway, Fenchurch Street Station, at 9.45; return ticket (to Southend) 2s. 6d.

Photographers' Benevolent Association.—March 18th, Mr. W. Bedford chairman. Two grants were cousidered and assistance granted. The following were elected as subscribers, viz., Messrs. Hargreaves, Matthews, Kerr, Misses Howe, Haigh, and Clarke.

We have been informed that perhaps such great purity of the mercury for M. Lippmaun's process as mentioned in these pages a few days ago may possibly not be necessary, but that Mr. Waruerke used a film which probably contained an undecomposed soluble silver salt, and did not employ spectrum colours.

# Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Elitor of the Photographic News, 5, Furnival Street, London, E.C.

All questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, London, N.

All Advertisements and communications relating to money matters, and or the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

The Photographic News is the oldest weekly photographic newspaper. See its consecutive number to-day on the front page.

Viator.—*Federation of Photographic Societies.* A joint committee, presided over by Mr. L. M. Biden, has this matter in hand, and your suggestions should be laid before that gentleman (c/o Assistant Secretary, Photographic Society, 50, Great Russell Street, W.C.). The *Association Belge de Photographie* has such a constitution, meeting at Brussels, Antwerp, Liége, and Ghent, and so, likewise, has the British Association for the Advancement of Science, so far as the reception of country delegates is concerned. The Society of Chemical Iudnstry (2,600 members) is composed of five or six sections, meeting in different centres, with head-quarters in London. The *Bulletin Belge* aud the *Jour. Soc. Chem. Industry* provide reports for all, but this fact does not stand in the way of the proceedings being farther discussed by independeut jouruals.

W. S. B. (Boston, Mass.)—*Life-Sized Heads.* Mr. H. H. Hay Cameron writes to say that most of the large portraits taken by his late mother were done with Jamin's lens, but she also used a large rapid rectilinear by Dallmeyer. As is well kuown, Mrs. Cameron aimed at art excelleuce in her work, rather than being piuned dowu to sharp optical definition, so that the lens employed was not, after all, a very important consideratiou. As previously reported, Messrs. J. Chaffin aud Sons, of Yeovil, used a Jamin lens, whilst Messrs. Robinsou and Cherrill employed a 7D Dallmeyer for their respective Crawshay prize portrait heads.

F. Smith.—*Registration of Designs.* Our publishers will undertake to lodge your specification and design on sending them thirteeu stamps. There seems a doubt, however, whether the main feature of your plan will be new, but the motto may carry it.

F. D. T. (Edinburgh).—*Mungo Ponton's Portrait.* There was no mistake in the reference. Be so good as to look again at the News of February 27th, top of last coloum, where it is said to form "the frontispiece of the Year-Book for 1882." We should be glad to see the details of your exchange scheme, which ought to interest those of us who are south of the Tweed.

A. M. M.—*Cost of Materials and Wages.* Your letter to hand; but, as we go to press so early, there is no time for calculatious of even greater difficulty than those given in our last. Leave the matter with us to think well over before reply.

H. J. B.—*Mr. Benham's Death.* We called on Wednesday at Mr. Benham's office, and when your letter came to say that he died on that same evening, whilst the committee of the Photographers' Benevoleut Associatiou were assembled in his office, we experieuced a most paiuful feeling of regret, which will be shared by all who are aware of the self-sacrificing labours of our amiable colleague, the late honorary solicitor.

A Correspondent reports that he has just developed a six years' old portrait exposure ou a dry plate, and that instead of getting a negative, the image came out as a transparency, which shows, moreover, traces of colour indications.

F. C. S.—*Cantor Lectures, &c.* The lectures recently delivered at the Society of Arts by Capt. Abney and Prof. Meldola respectively will be published later on, in the summer recess.

## Subscriptions to the Photographic News.

Including Postage to any part of the United Kingdom:—
Yearly...15s. 0d. | Half-Yearly...7s. 8d. | Quarterly... 3s. 0d.
To the United States, the Continent, and the Colonies:—
Yearly...17s. 4d. | Half-Yearly...8s. 8d. | Quarterly... 4s. 4d.
To India (Yearly) ... ... ... ... 19s. 6d.

# THE PHOTOGRAPHIC NEWS.

Vol. XXXV. No. 1700.—*April* 3, 1891.

CONTENTS.



## QUITE ANOTHER THING.

### Concerning Some Photographic Societies.

BY H. P. ROBINSON.

This is an age of progress, as I think has been often observed of other matters than those which are photographic. We ferment in photography, but I am not sure that we move as fast as we ought to do; indeed, I am equally uncertain whether some of us know exactly what photography is, or, like the Prince in Tennyson's "Medley," "know the shadow from the substance." Some mistakenly think our art is a pure science; others look upon it as a substitute for drawing in sepia; some rightly say it is a mechanical process; others, also rightly, graciously admit that it is a fine art; while the vast majority take it as an amusement pure and simple. It is a Protean affair altogether; but, whatever it is, unquestionably it is not a chemical industry, nor an optical problem.

It has become a great industry, if not a great art. If we have not been brilliant artistically in the past, we may become so in the future. There are some signs of an awakening. We have had fifty years of talk, and at least two of them at high pressure; we have achieved our jubilee; the tributary chemical and mechanical arts have done their duty in supplying us with inventions, perhaps greatly beyond our need; the Camera Club has gone into new premises; the Photographic Society of Great Britain has taken an attic all to itself, and there is some talk of confederation; besides which, the Institute is looming in the future. These accomplished and coming changes may cause the thoughtful to pause and consider if it is for the advantage of the art to continue on the old lines, or to attempt a new departure. As a contribution to the consideration, the following revolutionary suggestions are offered, not, however, without apology to those who prefer keeping to the old ruts, and to follow the old traditions.

We have, I believe, something like two hundred photographic societies in the United Kingdom, and on the Continent and in America they are increasing like —like rabbits. Is it not time that some of these societies became associations of photographers? "So they are," will be the almost universal reply, but in many cases it will be quite untrue. This proposition is not difficult of proof. As I understand, the plain meaning of the term a photographer is, one who photographs; who uses photographic materials either for making pictures, mapping the stars, taking the portraits of Mr. Pringle's little friends the microbes, or for lending a hand to almost every industry, and assisting every art. The application makes the photographer. In the smaller societies attention is certainly often called to the question how to do it; but it is a curious fact that the more important the society, the less is thought of application and the more of theory, the manufacture instead of the use of materials, until we get to the universally acknowledged head of all societies, the Photographic Society of Great Britain, when we seem to soar into the calm regions of undiluted science, uncomprehended by and useless to the real photographer, and, if one may judge by the last report of the Council as it was first presented to the annual meeting, very little else but pure science is wanted.

The report, graciously patronising the *art* of photography, said: "Although the meetings of this Society *should be devoted to the scientific rather than the artistic side* of our subject, an occasional paper on practical picture-making would be welcomed." This, it is true, was altered by the meeting, but it shows how the wind blows, and is scarcely encouraging to those who would be of practical use.

Now, what should we think of painters if they associated together, as they often do, under the name of sketching clubs, if they did nothing at their meetings but talk over the manufacture of their pigments, brushes, easels, and what not? Would they not rather deserve the name of artists' colourmen than artists? And why should those connected with photography mistake the materials for the art? I do not deny that the Royal Academy keeps a professor of chemistry, as it also does a chaplain, but it is carefully provided that he does not profess too much and swamp the art.

The usual subjects discussed at the Photographic Society bear about as much relation to photography as colour-making does to painting, type-founding and paper-making to printing, or copper-plate planishing to engraving. If we look down the list of papers read before the Society during the past year, we shall find them all interesting to those who care for such subjects, all desperately clever, but not more than one, or perhaps two, of any use to the practical photographer.

But there is a bright side to the shield. Our Society redeems itself in its exhibitions. Until lately—and it would do so now if it were not for Liverpool—it has held the principal exhibitions of photographs, not only in England, but the whole world. Even now it holds the best *annual* exhibitions, to which all the choice first-fruits of the year's art are sent, and—it must unfortunately be confessed—some of the worst. So that we who practise photography, and show our work in October, have not much to complain of except that the pictures shown at these exhibitions, as far as the chief feature, art, is concerned, are not the outcome of anything taught at the meetings of the Society, or by the Society in any other way, but of knowledge gained elsewhere. The curious issue is, that the Society teaches one thing, and shows another as the result. After all, everything is in order, for the first of the Society's rules tells us that its object "shall be the advancement of photography, and the branches of science and art connected therewith." But this rule was made for an infant which wanted feeding and nursing; photography is now full grown, and wants increased education.

The coming Institute should give us a chance of reformation. Before anything is done it should be thoroughly decided whether it is to be an Institute of Photography or an Institute of Photographic Chemistry, Optics, &c., which, as I have already pointed out, is quite another matter. I will go on the supposition that it is to be an Institute of Photography, although I don't find much encouragement to suppose so in the first proposals issued, which ask only for "the encouragement of photographic research, and the perfecting and practical teaching of photographic processes," with a very faint-hearted reference to art in the shape of "probable" exhibitions.

The first consideration in a Photographic Institute should be to teach photography as an independent art; the next as a handmaid to other arts; afterwards, as applied to industry and science; and I would make a strict law that the students should be compelled to select their department, and not flutter through the whole of them. The departments should be kept strictly separate. For instance, if, in the art department, a student was found wasting his time over a new developer, or a modification of an old one, he should be dismissed without benefit of clergy. The aspirants to the art department would have to pass a simple examination to discover what they know of the ordinary processes of photography, and a more severe one to disclose how much they would have to forget.

The Royal Academy itself, in its early days, admitted coach-painters as members, and the works of artists in hair to its exhibitions; we have, therefore, no precedent in that august body for drawing the line too closely, and I have not made up my mind as to whether a student with some knowledge of science should be admitted.

The principal visible use of photography is for portraiture; that I would have taught first, for comparatively few know how to take a portrait, and the crying want of the photographic world is the removal of the contents of the hideous show-cases that shock the eye of the artist, and degrade the taste of the multitude. Then I would tackle the amateurs, and teach them how to place a figure in a landscape, instead of weakly giving it up as too difficult. I would have lectures, illustrated by aid of the lantern, on composition, light and shade, and the history of art, with (as we profit by our failures) an occasional extra on artistic misfits, fads, and fashions. And then—and then, that decimal percentage of students who become artists must be left to evolve themselves.

The tributary arts, whether scientific or mechanical, I would encourage, on "a more removed ground," but not so that they should swamp art, as they try to do at some of our present societies. I would even, with the greatest generosity, endow research, but I would bar any more modifications of developers.

Just as much profit can sometimes be got by the use of improved machinery from the waste of old mines; there should be a department for reviving old arts and investigating discarded inventions by the light of modern science. I am nothing if not practical, and will give a well-known instance of what I mean. Every reader of the works of a certain great traveller in the last century knows that at the famous Academy of Lagado there was a professor engaged upon a project for extracting sunbeams out of cucumbers, which were to be put in phials hermetically sealed, and let out to warm the raw air in inclement summers at a reasonable rate. We have got used to inclement summers, and, personally, I enjoy the most artistic atmosphere on earth, and would not like to have it altered; but if we could bottle the cucumber-given sunbeams, they may be a convenient substitute for our present clumsy, but most effective, flash-light derived from magnesium. Neither would I exclude the impossible. The sunbeam extractors may also undertake the discovery of photography in colours, if it were only for the sake of supplying the much-believing outside press with exciting periodical paragraphs calculated to stimulate the interest of the public, and enable them to tell every photographer that it can be done, for they "have seen it in the papers."

Disputation should not be allowed in the general body; but, if a member felt an inward compulsion to prove that two and two made four, or that A was as good as B, other things being equal, and another to deny the proposition, there should be a quiet and retired room provided for them—to "press the button" in; the "rest" should be done by pamphlet. For it has been wisely observed that every community is volcanic and requires a crater, just as every steam engine should be supplied with a safety-valve; therefore the Institute should be provided, as Cornelius grippa recommends, with a place where "everye man ight plentifullye dispute of what matter he wolde, nd, with a certain artificial and huge heape of nownes nd verbes, symbols and figures, invente and dispute."

There may be some who will say that I do not mean ll this. Well, perhaps not in the letter, but unoubtedly in the spirit. I would reverse the intention f the sentence from the report I have quoted, and nake it run thus: "Although the meetings of this ociety *should be devoted to the artistic and practical side f our subject*, the council wish to state that papers on he theoretical and scientific aspects of photography vould occasionally be welcome on technical evenings." Every exhibition shows that if we do not know too nuch of science, we certainly know too little of art.

## THE CAMERA CLUB CONFERENCE.

The fifth annual conference, exhibition of members' picures and lantern slides will take place on Tuesday and Vednesday next, April 7th and 8th. The conference roper will be held in the Theatre of the Society of Arts by kind permission of the council), and will open each ay at 2 p.m. The following programme will show that here is a treat in store for all who are interested in hotography, and who care to take advantage of the nvitation to attend which is extended unconditionally to ll photographers.

Tuesday, April 7th.—Conference at the Society of Arts, 18, ohn Street, Adelphi, to be opened by the President at 2 p.m. Papers to be read from 2 p.m. to 5.30 p.m. in the Theatre:— 1) Captain W. de W. Abney, R.E. C.B., D.C.L., F.R.S., residential address; (2) Mr. Lyonel Clark, C.E., "The Use f Uncorrected Lenses"; (3) Mr. Joseph Pennell, "Photography as a Hindrance and a Help to Art"; (4) Rev. F. C. Lambert, M.A., "Note on the Physiological Aspect of Some Problems in Art." At 8 p.m., exhibition of lantern slides in he Theatre.

Wednesday, April 8th, 2 p.m.—Renewal of Conference in he Theatre, Society of Arts. Papers to be read from 2 p.m. o 5.30 p.m.:—(1) Major J. F. Nott, "Photography and llustrated Journalism"; (2) Mr. C. V. Boys, "An Application of Photography"; (3) Prof. Minchin, "A Review of Photo-Electricity." At 7.30 p.m., annual club dinner for nembers and friends at the Criterion Restaurant.

The annual exhibition of photographs by members will be on iew in the Club House Meeting Room, Charing Cross Road, rom 10 a.m. to 4 p.m. Admission by card from any member f the Club, or by ticket from the hon. secretary. The exhiition will be open under these conditions for about six weeks rom Tuesday, April 7th.

The meetings at the Society of Arts are open to ladies.

Those who have a large stock of negatives constantly inreasing in number are often apt to ask themselves what is to e done with them all? There is a natural repugnance to lestroy that which has cost knowledge and pains to produce, ut yet something must be done with the useless lumber. An American photographer lately solved the problem by applying is old negatives to hot-house purposes, but that the transction was not altogether satisfactory the sequel, quoted from Virginian paper, will show. A short statement of the facts s as follows: Davis, the photographer on Broad Street, some ime ago sold to a florist a lot of refused negatives, which he vanted to use to cover his hot-house. Foster bought some our hundred of the negatives from the florist, and from these rinted photographs and exposed them as specimens in his gallery on Ninth Street. Davis obtained an injunction to prerent Foster from so using the negatives, and the court perpetuated the injunction.

## THE PORTRAITURE OF THE STARS.

BY JAMES MEW.

It is said that Chaldean shepherds were the first astronomers. They certainly possessed two essential conditions of stellar study: their climate was clear, and the practice of their profession probably left them a large amount of leisure time for the contemplation of the spangled skies. With the people of a later age and a far removed position, with the English folk of the end of the nineteenth century, these two conditions of time unoccupied and a pellucid air are commonly absent. The great majority of mankind are now so pressed by the business of the day, that the season of the night is devoted to relaxation or pleasure or sleep, while those few who have an inclination for what is commonly called "star-gazing," with all the means and appliances to boot, are prevented on nine occasions out of ten by inauspicious and inclement atmospheric caprice from the fulfilment of their desire. And so the greater part of the modern world, though formed not with prone faces as other animals, but to bear aloft their erected features to the skies, is content with little regard of them, looking upon the heavens—with more poetry than intelligence—as an immense sea sprinkled with phosphorescent isles, or a field full of nocturnal flowers, as a vast plain sown with dust diamonds, or an azure vault of crystal studded with myriads of golden nails. The most glorious of nebulæ in our northern hemisphere, the flaming cluster in the handle of Orion's sword, is hardly for them that mass of incandescent gases which the photographer has discovered by the aid of the spectrum. Nay, for them Orion and Eridanus are all one. They can recognize no difference between Corvus and Columba. They are capable of confounding Fomalhaut or the mouth of the fish with Fornax, and the Corona Borealis with Bootes or Berenice's Hair. They are familiar with the rhyme of their infancy, chanted to them by their nurse while watching those far-distant shaking fires—

Twinkle! twinkle! little star,
How I wonder what you are;

and, unlike Arago, they are content to wonder at this archipelago of worlds.

This same twinkling star

Up above the world so high,
Like a diamond in the sky,

which has obtained the dignity of a translation into Latin by the Rev. H. Drury in the *Arundines Cami*:—

Mica, mica, parva stella,
Miror quænam sis tam bella;
Splendens eminus in illo
Alba velut gemma cœlo,

the original is not commonly known. It is to be found in "Hymns for Infant Minds," by Ann and Jane Taylor, and consists of five stanzas, of which the lines quoted make the first. The remaining verses express the gratitude of the traveller in the dark—

He could not see which way to go,
If you did not twinkle so;

and conclude with the author's confession of ignorance as to what the twinkling star really is. The poem well expresses the state of popular—perhaps scientific—knowledge on the subject.

The sacred record is concise: "He made the stars also," of which expression "he made" is not in the original. This sublimity is diluted, for the sake of a little sermon, by Adam Clark's commentary, which says that in

1792 Dr. Herschel found "258,000 stars passing through the field of view in his telescope in forty-six minutes. What must God be, who has made, governs, and supports, &c.?"

In a pamphlet by Professor Pickering, we learn that stellar photography originated in an experiment made upon three stars at the Harvard College Observatory in 1850. A sensitive Daguerreotype plate was then and there placed in the focus of the 15-in. equatorial, pointed by a driving clock upon α *Lyræ*. A satisfactory image was obtained. The double star α *Geminorum* gave, owing to its two components, an elongated portrait. No impression was obtained from the Pole star, however long the exposure continued. In 1857 the machinery of the clock was improved, and photographic sensitiveness was increased by the introduction of collodion. The *Astronomische Nachrichten* (vols. 47 to 49) will furnish to the curious reader much valuable information on this subject of early stellar photographic investigation.

Professor Vogel has lately shown that Spica in the Virgin is double, consisting of a light and a dark star, with a revolution period of four days; and Professor Pickering states that ζ in Arcturus, and β in the Wagoner, have their spectrum lines, one single, one double, with periods of fifty-two and four days respectively. These are therefore ordinary double stars, but their distance from one another is so small that no telescope can determine their separation. Pickering afterwards found also a periodic doubling of lines in Ophiuchi. In a late number of the Photographic News it was shown that stellar photography is sometimes self-corrective. It was formerly supposed that there was spectroscopic evidence of the duplicity of α *Lyræ*. Later on, photography showed that this duplicity was rather in the spectator than in the star. Since 1888, Prof. F. C. Vogel has taken eleven pictures of the spectrum, and the lines in all were perfectly sharp and single.

α *Lyræ* has indeed been a bone of photographic contention. Mr. Fowler proved the duplicity of the star in a manner satisfactory to himself, by a picture produced, it would seem, by a special instrument in which the lines were doubled. But then rose up Vogel, and the Brothers Henry, and also proved, from pictures made by their own instruments, that no trace of duplicity in α *Lyræ* was discoverable. Either therefore, if these authorities be considered, Mr. Fowler's photographs or his calculations were inaccurate. A little quirk of witticism was then let off by Captain Noble, involving allusions to Cocker and Walkingham, to celebrate the occasion. The moral of this business has been thus neatly summed up by the Editor of the Photographic News. Since photographic illustrations are made up of so many elements, it is unsafe to rely upon any single result until it has been verified by repeated experiments. The alleged doubling of α *Lyræ* is a precedent which it behoves the astronomical photographer to bear in mind.

Dr. Huggins seems first to have used photography as an instrument of research into stellar physical conditions. In 1863 he obtained microscopic prints of the spectra of Sirius and Capella. These were merely characterless streaks without lines. Thirteen years later, with the 18-inch speculum, prisms of Iceland spar, and lenses of quartz, he obtained a photograph of the spectrum of Vega, a white star, with seven strong lines. In 1879 he kept the image of Vega, by continual adjustments, exactly projected upon a slit $\frac{1}{350}$th of an inch wide, during an hour, in order to get the characters of its analysed light on a gelatine plate of the highest sensitiveness. The ultra-violet spectrum showed twelve strong lines intersecting it at intervals diminishing regularly upwards, and denoting the substance of hydrogen. In the yellow stars, Capella and Arcturus, the series was associated with many other lines, their state approximating to that of the sun.

Of the red stars, Betelgeux is a star of the first magnitude in the eastern shoulder of Orion, called by the Arabs *Aljauza*. Abdarrahman Assufi, in his astronomical treatise, says the "second star (of Orion) is the bright, the large, the red, which is on his right shoulder." It is of the first degree, and is called *mankib al jauza*, or *yad al jauza*, indifferently. The word "Betelgeux" (the French *Betelgeuse* is nearer the correct pronunciation) has arisen from a confusion of this star with the astrologers' *bait al jauza*, or House of the Twins. This Betelgeux is so remarkably deficient in actinic rays that, with an exposure forty times that required for Sirius, only a faint, spirit-like impression could be obtained; while from Aldebaran, the brilliant red star in the eye of the Bull, counted by Alfargani among the fifteen stars of the first magnitude, no impression whatever was perceptible. According to the shaikh Ahmad ibn al Muaddim, this star is so called because it comes after the Pleiades. It is so called, *par excellence*, just as the Pleiades are, by Arabian astronomers, called "the stars."

The same process was successfully applied to the Orion nebula in 1882. Five lines were the result of forty-five seconds of exposure. Of these, four were the known visible rays, and the fifth seemed to agree with one of the hydrogen set of Vega. The bright rays were connected by a faint, continuous spectrum derived from the nebulous "knots" near the trapezium. This was thought to indicate the beginning of an orderly revolving system reserved for the future habitation of so-called rational beings. "It may be so," says Agnes M. Clarke, from whom this account has been derived: "the ways of creative power are dark."

In 1886 a simultaneous impression was obtained with an exposure of thirty-four seconds of the spectra of some forty Pleiades. The hydrogen lines were in all predominant. In 1883 Mr. Common, with an exposure of thirty-seven seconds, obtained a splendid picture of the Orion nebula in the focus of his three-foot silver on glass mirror. Photography then definitely assumed the office of historiographer to the nebulæ.

Mr. Isaac Roberts has lately given photographic evidence of variability in the nucleus of the great nebula in Andromeda. From a large number of negatives taken with exposures varying from five minutes to one hour in duration—of which some only have a decidedly stellar appearance—this inference of variability in the nucleus has been drawn. Mr. Barnard, of the Lick Observatory, during the month of last November—intent on the nebulosities of the Pleiades—discovered a new cometary nebula close south of them, and following Merope. But though the position of this nebula has been determined, it has not yet been photographed, owing to the fact that the long exposure necessary would over-expose Merope to such an extent that the luminosity of the two would coalesce.

Of course, in these sidereal investigations, the camera and the telescope are mutual friends. Of them may be quoted that old fable of Menenius, called the "Belly and its Memers." In an able paper lately published by Mr. Common, we learn that the aperture of the refracting telescope has greatly increased. In 1863 Cooke completed the 25-inch refractor now in the possession of the Cambridge University. Alvan Clark manufactured the 36-inch telescope lately erected at Mount Hamilton, California, under the direction of Professor Holden. The reflecting telescope has grown *pari passu* with its elder brother. In France there is one of four feet at the Paris Observatory. In England, too, this form of telescope is largely used, and, says Mr. Common, mirrors up to five feet in diameter have been made and mounted equatorially. Reflecting telescopes give images absolutely achromatic, but their mounting is less perfect than that of the refracting.

"It is well known," says Dr. Duner, the astronomical professor in the Swedish University of Upsala, "that the subjects of photographic portraiture are either self-illumined, or so strongly lighted that their reflected rays are able to reproduce their picture." To show, by means of photography, the existence of a heavenly body which can produce no impression upon the bromide silver gelatine has been reserved for the present time. As long as two hundred and twenty years ago, it has been known that there was great variation in the degree of light emitted by the star Algol (β *Persei*) in the head of Medusa. The Arabs call the head of Medusa held by Perseus the head of the ghoul, a malignant supernatural demon of variable form devouring men and well known to the readers of the Arabian Nights. The marked fluctuations of light in this member of the constellation of Perseus was already noticed in 1669 by Montanari. Algol is indeed the leading light of a small group containing about a hundred of so-called variable stars. Amongst these, after Algol, Mira (ο *Ceti*) and (η *Argus*), of the southern hemisphere, exhibit variations of the most extraordinary character. Mira in Cetus, so called from this peculiarity, appears at its brightest of the second magnitude, whence it gradually wanes to the twelfth, and then increases to its former splendour. An interval of some 330 days occurs between its periods of greatest brightness. Algol is best seen on the early evenings. In autumn, after sunset, it shines low down in the north-east of the heavens, in spring low down on the north-west, and in winter it flashes high in the north, not far from the zenith. The variations of its radiance were first accurately observed in 1782, when it was shown that its light was constant and steady as that of a star of the second magnitude for 2 days, 20 hours, and 49 minutes, after which it gradually faded till it reached a minimum, or that of a star of the fourth magnitude, in 4½ hours, recovering its original splendour in 4 hours. Of this change of 9½ hours, only about 5 hours is distinctly perceptible. The diminution of light is also strictly impartial. Its pure white radiance is the same in kind, however decreased in quantity. Professor Vogel, of the Astrophysical Observatory of Potsdam, has shown by the spectrograph that the old hypothesis of the cause of the change of light in Algol is undoubtedly true, and that Algol is a double star consisting of a light star of 1,725,000 kilometres diameter, and a dark of 1,350,000, of which the former weighs four-ninths, and the latter two-ninths of the sun, while they are at a distance from one another of 5¼ million kilometres, or one-tenth of the distance of Mercury from the sun.

Vogel has also, by the aid of the camera, determined the velocity of some of the so-called fixed stars. Of course fewer waves of light enter the eye in a given time as the star recedes, and more as it approaches. This causes a shifting of the lines in the spectrum of the star's light, which can be photographed. It is hardly necessary to add, except for those whose knowledge of astronomy is represented by Miss Taylor's hymn, that this light is not of the present but of the past. Photographs of the great nebula of Orion show the light of that nebula, supposing it not to be absorbed in any degree in space, as it was not less than sixty thousand years ago. All that vast period of time has been consumed in its attempt to penetrate that which intervenes between us and it, and its shaken splendour is probably due to the difference of velocity of rays traversing strata unequally warm or unequally cold, unequally humid or unequally dry.

To judicial astrology the science of photography has aided other sciences to administer a destructive stroke. The faithlessness of our later age attributes no more virtue to Antares (α *Scorpionis*), the scorpion's heart and the red rival of Mars, or to Rigel (β *Orionis*), which derives its name from its situation in the left foot of that strangely generated giant, than, as Burton complained in his own time, to the signs at an inn-keeper's post or a tradesman's shop. The great book in whose flaming letters are written, if we may believe ancient learning, so many strange things for such as are able to read them; that excellent harp made by an eminent workman, on which he that can but play will make most admirable music—both are still studied, but in a fashion far different from that of yore. The pictorial stellar maps of Ptolemy's Almagest have given place to the *Sternverzeichniss* of Argelander. The animal configurations attributed to the heroic age excite now only a lukewarm interest; but the method of Bayer of Augsburg, involving the use of the Greek and Roman alphabets, invented more than two and a-half centuries ago, is now fast attaining universal learned recognition.

If all these matters are too recondite to attract the public interest, the popular eye may delight itself with pictures of Cygnus and the Pleiades taken at Paris by the brothers Henry, and by slides of Jupiter and Saturn taken by Pickering in America; by the details of the nebulæ of Orion and Andromeda revealed by Common and Roberts, and by a photographic survey of the whole southern hemisphere by Dr. Gill, of the Observatory at Cape Town. Thus may the observer learn to appreciate that picture of the entire sky proposed by Admiral Mouchez, when the good time arrives of its realization.

Photography has already done astronomy yeoman's service, and gives rich promises of doing still more. The new method of investigation has not only greatly lessened the difficulty of variable stars of the Algol type, and generally increased our knowledge of double stars; it has also acquainted us with the diameter and weight of fixed stars, concerning which subjects, except with regard to our own sun, the world hitherto has been wholly ignorant.

---

Limit of Magnification for Photo-Micrography.—Mr. Nelson, says the *Journal of Microscopy*, puts this at 1,000. He has reached 1,500, and, in special instances, even 1,650; but he regards 1,000 as a useful limit. This can be obtained by an inch objective, with an eye-piece giving twenty times the initial power of the lens.

Friedrich Jamrath.—The *Photographische Nachrichten* of March 26th records the death on the 19th inst., after a short illness, in his eighty-first year, of Friedrich Jamrath, portrait painter and Court photographer at Berlin. The deceased had been a zealous member of the Photographischen Vereins zu Berlin from its establishment.

## THE PRESENT STATE OF THE PHOTOGRAPHIC PROFESSION.

BY J. VINCENT ELSDEN, B.Sc. (LOND.), F.C.S.

The time has long since passed for the discussion of the once-debated question whether the practice of photography properly ranks amongst the professions. In the present case, however, the use of the word *profession* is unavoidable; for the term *trade*, including as it does all who devote their business energies to the production of photographic materials, carries us far beyond the limits of the ordinary occupation of the professional photographer. It is the latter, and not the manufacturer of photographic materials, whose interests at the present day are so rudely assailed by the ever-increasing number of amateurs, who do not hesitate to encroach upon the domain of professionals by making what profit they can out of their hobby.

In considering the present state and prospects of photography as a business, the first question which we have to approach is whether we have yet seen the full extent of the mischief done by the interference of amateurs, or will these amateurs still further increase in number until the demand for professional work stops entirely?

Let us first, therefore, briefly examine the causes which contribute to the increase in their number. In the first place, every simplification of the details of the process, everything which makes the taking of a good photograph easier than before, will necessarily entice a larger number of persons into attempting it. In the early days of photography, when the wet process reigned supreme, when photographers had to contend against all the freaks of the nitrate of silver bath, to say nothing of the cumbrous appendages necessary for the immediate development of the negative when away from the studio, with all the accompaniments of stained fingers and noxious smells, then the amateur held aloof, and professionals enjoyed a monopoly which brought with it a rich harvest of profit.

In addition to the greater ease and simplicity of the dry plate process, another factor no less important in connection with amateur photography is the expense of the necessary apparatus. The greater sensitiveness of modern dry plates no longer necessitates the employment of such expensive lenses, and various kinds of apparatus are now to be obtained at prices which lie within the reach of all.

Then we have to consider the advance of the popular knowledge of photographic matters. What was, a few years ago, looked upon as a mystic art, difficult to acquire and impossible to understand, is now considered easy of attainment, and ceases to excite the wonder even of the country urchin.

Above all these incentives to the practice of photography is the fascination of a process which gives to all the power of accurately delineating nature, and makes an imaginary artist where no single idea of art existed before.

Surely all these factors have now operated sufficiently long for the adjustment of the natural balance which invariably regulates popular fancy. Amateur photographers cannot go on increasing in number to a much greater extent, and professionals must certainly soon have felt the full force of their influence.

It is small consolation, perhaps, to consider that this amateur question is not confined to photography alone. It has for a long time influenced other callings, but the excitement in these cases passed away when it was seen how little real harm was done. Consider for a moment the professional position of those engaged in education, music, painting. Are there no amateurs here? Does not the teaching profession swarm with empirics, destitute alike of qualifications to teach or of knowledge to impart? Is the position of an able musician injured by the thousands of young ladies who imagine themselves qualified to give lessons on the pianoforte? Does a first-class artist suffer much real harm from the many who dabble in oil or water-colour? Yet if these professions had ever enjoyed a similar monopoly to that formerly possessed by the photographer, their hardships would have been just as pronounced, and their outcries as loud as those now raised against the photographic amateur. In point of fact, we find the position of these professions improved in the long run by the stimulus given to the public taste by the efforts of amateur exponents of their art, and by the increased appreciation in which the superior abilities of professionals are held by the public.

Will not photographers experience in time some, at least, of these same benefits? The general public is gradually becoming endowed with an ability to appreciate good work, and with the power to discriminate good work from bad. The frequent failures of amateurs and their generally indifferent results will gradually lead to a universal desire for the very best work that can be produced, and the more widespread the knowledge of photography becomes, the more will it be utilised, until at last what has hitherto been considered a more or less extravagant luxury will be regarded as almost a necessity.

It is not necessary here to dwell upon the reasons why the ordinary amateur can never compete with the professional in technical excellence and artistic finish, and herein lies the safeguard of the photographic business. Nor do we class with ordinary amateurs those scientific workers in photography whose researches have been mainly instrumental in producing the present state of perfection of the art. There is as much difference between the scientific investigator and the ordinary amateur as there is between the manager of a first-class photographic business and the itinerant photographer who works at a low profit on the sands at Margate.

Leaving, now, the amateur question, it remains to consider what other causes contribute towards the disappointment in the existing state of the photographic business. Chief amongst these will undoubtedly be the large reduction in profits since the palmy days of old. Here, at least, the amateur is not so much to blame as the professional himself. The struggle for existence has resulted, as usual, in an almost universal cutting of prices. The want of a proper trade organisation, combined with the violent internal opposition of what may be termed second-rate workers, has necessitated a general lowering of the scale of charges; and this, too, just at a time when the expenses are more than they were formerly, for no one will deny that the old wet process was far more economical, and left a wider margin of profit than is possible now.

Another cause which retards the professional photographer is himself. The art is still so young, and discoveries have followed each other so closely, that the professional has scarcely had the time, even if he has had the inclination, to follow up all the newest developments. For this reason he is very apt to become wedded to the old methods in which he has already won success. His ientific knowledge, too, is often insufficient, and this one prevents him from keeping pace with the rapid rides of his art; but advance he must if he wishes to old his own. The successful professional photographer the future will be he who, by careful technical training, as qualified himself for a profession which, besides all e usual requirements of business capacity, demands ientific and artistic attainments of the very first order. aving once acquired these, he need not fear that his ture success will be endangered either by the opposition his own class or by the imitation of the amateur.

## BROMIDE PAPER AND ENLARGEMENTS.

BY CHARLES HUFFELL (RIO GRANDE DE SUL, BRAZIL).

SUPPOSE there have been many in the photographic rofession situated at one time or another as I have been -viz., in want of a piece of bromide paper, and without e means of supplying that want at the moment. An t-repeated experience of this kind was the means at last my making myself independent, and I hasten to give y formulæ for the benefit of others. I do not say that e method is the best, but in my hands it has proved apable of giving results equal to those produced upon me commercial papers.

Place 200 grains of Coignet's gelatine in a thoroughly ean stone bottle having a tight-fitting cork; add 82 of romide of potassium, 2 grains of citric acid, 2 grains of hrome alum, and 8 ozs. water. Shake the bottle well ntil the salts are dissolved, then heat in boiling water for bout ten minutes, shaking well at intervals of three inutes. Remove to the dark room, and, excluding all hite light, add 110 grains of nitrate of silver in large rystals to the already melted bromised gelatine. Cork he bottle tightly, and shake very thoroughly for about ve minutes; then stand for the froth to subside. After bout fifteen minutes the emulsion may be poured out nto a shallow dish to set. When it is thoroughly set, crape the emulsion up and place it in a canvas bag; ring the bag, so that the emulsion will be forced through he meshes of the canvas into a basin of clean water; enew this water six times at intervals of ten minutes; at he end of that time gather the shreds of emulsion and lace them upon a hair sieve to drain for about six hours—onger will not hurt. After it has drained well, place the mulsion in a milk jug with a spout, and melt; then add drams of alcohol, and if your emulsion measures less han 10 ozs., make it up with distilled water to that quantity; hen filter through two thicknesses of flannel into a horoughly cleaned stone bottle, and the emulsion is eady to coat the paper.

The kind of paper I have used, and found better than nything else, is ordinary albumenised paper. The albumen I coagulate by passing the paper through boiling water; this forms an excellent substratum, keeping the mulsion on the surface of the paper, and rendering the mage more brilliant. Take a piece of this paper of the ize required, moisten it in water, and place it, albumen ide upwards, upon a piece of glass of the exact size of the paper; pass a wet sponge over the face of the paper until t lies perfectly flat; take care that it *does* lie flat. Prepare as many of these as you require before commencing o coat the paper.

Now light the dark room lantern, and, having previously ccurately levelled a board or piece of plate glass by means of a spirit-level, take one of your paper-covered glasses, and pass a *slightly* damp sponge evenly over the surface of the paper; then take the emulsion (already melted, but not at all hot, for if it is hot it will cause blisters) and pour a pool in the centre of the paper; tilt it from corner to corner so that the emulsion may cover the surface entirely, and return the surplus to the bottle. Do not drain too much, as a rather thick coating gives the best results. Then rock the plate evenly for some seconds in a horizontal position, and place it upon the levelled board to set. It will be found that wetting the surface of the paper slightly before coating will cause the emulsion to flow as easily as collodion does on a glass plate. When the emulsion has set, the paper may be stripped from the glass and hung up in the drying room to dry; it is then ready for use.

This paper will be found rather slow, but that I maintain to be an improvement, as the exposure is more under control, and the risk of fogging from imperfect insulation from light is much less than with a rapid class of paper. An enlargement of a quarter-plate up to 12 by 10 with a small stop will require about eighty seconds' exposure on a bright day; but the time in each case can only be determined by experiment, as, no doubt, the actinic power of the light in England is inferior to what it is in this country.

I prefer, after exposure, to thoroughly wet the paper in a dish of water, and then place it upon a piece of glass, and develop in the same way as a wet collodion plate, by pouring the developer upon the paper, and allowing it to run over every part. If the paper be at all repellent, a broad camel-hair brush charged with the developer, and brushed over the surface, will make the developer flow evenly. Ferrous oxalate is the one used, with the addition of a small quantity of a restrainer. When development is completed, the paper must be thoroughly acidified with citric or tartaric acid before it is washed, or else pure whites must not be expected. After washing, it is fixed in hypo 5 ozs., water 16 ozs.; thoroughly washed again to eliminate every trace of hypo; then dried and mounted.

Care must be taken in every stage, or success will not be attained, as it is more easy to fail than to succeed; but, with ordinary care and cleanliness in all the manipulations, there is no reason why anybody should fail.

## ON ENAMELLING PHOTOGRAPHS.

BY H. C. R. HARLEY.

As only a few short formulæ are to be found in the photographic journals one comes across on the above subject, the following has been compiled for those who may be anxious to try the process. I must, however, acknowledge that no part of what follows is original; but is a précis of the process published under the heading of "A Practical Treatise on Enamelling and Retouching in Photography," by P. Piquepé.

It is important that the glasses used to squeegee the prints on to should be without any flaw, and patent plate; the next important point is their cleaning; the following is recommended as a good solution for this purpose, viz., alcohol 100 parts, tripoli 5 parts, and iodine 1 part: shake well before using. When required for use, pour a few drops on the glass, rub well all over until quite dry, then with a wash leather rub hard, but not too hard, and in a few seconds the glass will be clean.

The first operation in enamelling consists in interposing between the collodion and the plate an isolating substance to facilitate the transfer of the finished print; the simplest and safest for this purpose is talc, or French chalk, to be used thus: Take a piece of old calico, rather fine, pour into it a certain quantity of talc, tie up the corners, and squeeze it all to the centre till you have got a ball as big as an egg; with this rub the plate all over with a rotatory movement from the centre towards the edges till quite brilliant; the lump of talc can be used over and over again till exhausted. Now take a damp cloth, and pass it round all the edges of the glass to the depth of about one-sixth of an inch, so as to remove the talc from the place along which the damp cloth has been passed. Another method is to pass round the edges of the glass, instead of the damp cloth, but to the same depth, a brush dipped in albumen. The plate, having been treated as above, is put into a rack to dry. When dry, take plain collodion as fluid as possible, and, after lightly dusting the surface of the prepared plate, pour the collodion on the plate in the ordinary way, taking care that every part of it is covered, including the edge, off which the talc has been wiped, or brushed over with albumen; otherwise the print would begin to detach itself in that spot. The layer of collodion should be very fine and transparent.

While plates so prepared are put aside to dry, take fine, white sheet gelatine in sufficient quantity for the number of plates to be done, and, placing it in a clean tray, add sufficient cold water to cover it; allow this to soak for some hours, then put it into a saucepan, which stand inside another full of water, placed in a quick fire, and stir it from time to time till thoroughly dissolved. A quart of gelatine prepared as above will cover 250 plates; what is over need not be thrown away, but put aside for future use.

When the gelatine is dissolved, filter through very fine linen into a bottle strong enough to stand heat, and, having filled it to the top, wait a few minutes till all the air-bubbles have come to the top, which should be blown off; then take a very clean dish, which should have one end of it raised by a piece of wood or any other support, and into this pour the gelatine very slowly, so as to avoid air-bubbles, until the liquid just covers the raised end. Now take one of the collodionised plates by a corner, and, having the coated surface towards the gelatine solution, rest one end of the plate on the raised end of the dish, and, supporting the other end on a silver or ebonite hook, gently lower it until the collodionised surface rests on or touches the liquid in the dish, without allowing the gelatine to get on to the back of the plate: then lift up very slowly, and, having drained it for a moment, lay the plate flat on a shelf well protected from dust. Do this in a good light, and very slowly. The plates thus coated should be left to dry for ten or twelve hours in a warm room, and when dry can be stowed away for use, and will keep good for a long time.

Plates of a large size should receive at least two successive films of gelatine, leaving plenty of time to dry between each coating. The greater the number of films the plate receives, the greater will be the depth, strength, brilliancy, and delicacy of the enamel. This completes the preparation of the plates, which ar now ready to receive the photographs to be enamelled. But before doing anything, see that everything is in its place, so that the work may proceed rapidly and with certainty.

To begin with, prepare the following solution:—Gelatine 4 ounces, water 54 ounces; soak the gelatine in the water for some hours, and complete the melting by putting it into a saucepan over a slow fire and stirring it every now and then; while this is being got ready, place on your left side and within reach the box containing the collodionised and gelatinised plates; near this have a rack to receive the plates after the photographs have been fixed to them, and near by have a stove with a large chop tin dish full of hot water; it will be well to have two handles to this dish, so that when necessary it may be moved off the stove with facility. In the hot water in this dish, stand two porcelain dishes large enough to contain the prepared plates and photographs to be enamelled. Have ready also a sponge and a squeegee. Now filter the dissolved gelatine into both these dishes, taking care to avoid air-bubbles as much as possible. This done, take the vessel containing the hot water and the two dishes with the gelatine solution off the stove, or the solutions will become too hot, and immerse a few of the prints in the dish on the right-hand side. Then take one of the prepared plates and lay it with the collodionised side in contact with the solution in the left-hand dish. *Raise the plate immediately this is done*, otherwise the preliminary pellicle will become softened, and, taking one of the prints from the gelatine solution, lay it with its face in the collodionised surface. Hold it in its place, and with a squeegee rub, not too hard, the back of the print to get rid of the excess of gelatine and air-bubbles. Turn up the glass, wipe it over with the sponge soaked in warm water, and make sure that there are no air-bubbles; if any, run the squeegee along the back till they are got rid of.

All these operations should be done quickly, so as not to give the gelatine time to coagulate. Put the plates on the rack to dry. The rack for these plates should have very wide grooves, so as to avoid rubbing the pellicle, which at this stage is very tender and soft.

The solution of gelatine should not be too hot, or the prints will turn yellow. If the water in which the dishes containing the dishes with gelatine solution begins to cool before the pictures are all mounted, it must be re-heated. It is difficult to say how long these plates will take to dry. In very hot weather choose a very airy room, and not too warm, in which to dry them. An enamel can never be too much dried; on an average it may dry in twelve to fifteen hours, but it is best to allow it a longer time. As soon as it is quite dry to the touch, with the point of a penknife cut the pellicle inside the albumenised edge, and insert the knife so as to get hold of the print between it and the thumb, and raise it gently. If sufficiently dry, the pellicle will, in detaching itself, make a dry, hard sound like tearing a piece of parchment or calico. After they are detached, the prints must be kept quite flat. The prints can now be trimmed and mounted as suited to each individual fancy, but care should be taken that the enamelled surfaces are touched as little as possible with the fingers.—*Journal of the Photographic Society of India.*

---

*The Beacon*, a photographic journal published at Chicago, is responsible for the following:—Crystallos is a new transparent substitute for glass, manufactured by M. Jumeaux, the great doll maker of Paris, and is said to be the outcome of three years' work and study, and at a cost of over 300,000 francs. It is not a plagiarism of the Eastman film, not xylonite, nor collodion, nor gelatine, nor rubber. It is simply crystallos, a new material; bright, pure, transparent, inextensible, splendid, and—perfect; so, at least, says a correspondent; and it is also comparatively cheap, the $6\frac{1}{2}$ by $4\frac{3}{4}$, coated with a very rapid emulsion, being retailed at about a dollar a dozen.

## THE PERMANENCY OF PHOTOGRAPHS.*

BY FR. WILDE.

I will now call attention to another troublesome matter, which has not been obviated notwithstanding the repeated warnings given, viz., the use of cards for mounting prints which have been printed with bronze powder. The fine bronze powder never adheres so fast to the mount but that some particles, in packing or handling, become spread over the mount. If these particles are not carefully removed, they will cause spots and blemishes, for whose appearance you will not have long to wait. We ask, must bronze powder be used? No. Why so thoughtlessly use a medium which destroys the photograph? Fine coloured inks can be used to produce just as fine and tasteful effects, and give no cause for destroying the photograph in the course of time. I cannot, while upon this subject, refrain from calling attention to the tendency, lately evolved, which has resulted in the mounts being overloaded with gaudy decorations. Simple embellishments with good taste are certainly easily combined, and are far preferable. While we complain about the shrinkage of the prices for photographs, yet at the same time we reduce the margin of profit still more by extravagance in the gaudy and useless embellishments on our mounts.

In several of our leading and most frequented galleries the experiment was tried to again return to the use of plain mounts, without any noticeable diminution of patronage. It is well to be cautious in the use of dark-coloured mounts, and especially in all where the colour is coated, it is best to confine ourselves to neutral mounts—either white or faint tints of grey or buff.

Silver prints are also made on argentic chloride collodion paper—argentic, chloride, gelatine, and bromo-silver-gelatine papers. Regarding the first of these three specialities, I have had an experience since 1876, and can testify that they are permanent. I must, however, mention that, in isolated cases, the film or coating is apt to strip or peel off; possibly the emulsion used in such cases was too stiff. Many photographers are in the habit of using argentic collodion prints in their show-cases, as they are supposed to be more permanent than prints on albumenised paper. This is true only in the case of pink-tinted albumen paper, which, if continuously exposed to bright daylight, soon looses its delicate shade, and becomes tawny like a piece of chamois leather. In tinted argentic collodion papers the pigment is not incorporated with the emulsion, but is added to the coating of barytes on the paper, and which serves as the support to the sensitive film. In colouring barytes more stable pigments can be used than with albumen.

Regarding prints on chloro-silver-gelatine and bromo-silver-gelatine papers, my experience regarding the first extends over a period of eight years; regarding the latter, six years, and are of such a character that I do not doubt their stability. Notwithstanding the advantages offered by these three latter processes, they have for some reason interfered but little with the production of the albumen print. When I ventured the query, why? the answer has usually been: Our operator can turn out enough work with the easier albumen process. This may be true, but if so little opportunity is given to our apprentices to learn the various processes in photography, where are the experienced experts of the future to come from?

* Continued from page 244.

I repeat what I have before stated, that the photographer who is careful to conscientiously eliminate every vestige of hypo from his prints, and exercises the necessary caution in the selection of his materials, may safely guarantee the stability of his albumen prints—of course, provided nothing is wrong with the paper, which unfortunately will occur, and is altogether out of the control of the photographer. With Steinbach paper, as well as that bearing the water-mark "Rives," I have never discovered any fault. Other papers may be just as reliable, but none should be used for photographic purposes until proven to be so beyond doubt.

About the year 1855 I bought a number of fine engravings from the most renowned art institute in Munich—pictures which had no connection with photographic baths or processes—and yet they discoloured and turned yellow. The first became apparent in one where the glass was broken. I then noticed that where the paper was protected by the mat it had remained perfectly white, but where exposed to the light it had become noticeably yellow. In this case the paper alone was to blame. If similar paper had been used for photographic purposes, and the same result ensued, the blame would have been cast upon the means and materials used in producing the photographic image.

Carbon prints, in which the reproduction of the beauty of a high-class negative is so decidedly superior to a silver print, are of undoubted stability, provided that only such colour or pigments are used to colour the gelatine whose stability in the light has been proved. It was with the object in view to supplant the wholesale production of albumen prints that pigments were used which would reproduce the favourite tints of the albumen prints. To achieve this object, pigments were requisite which were not permanent, and seemingly faded still more rapidly, and assumed a dirtier shade when used with gelatine, than when used with albumen. Thereby the manufacturers of pigment papers committed a grievous error, and placed a weapon in the hands of the enemies of the carbon process, and such photographers who opposed any substitute for the albumen process, with which the introduction of the carbon process was successfully opposed. With permanent pigments beautiful pictures can be made, which well deserve the approval of a critical public. However, any process where the necessary depth of printing cannot be watched will scarcely ever gain the favour of the bulk of professional photographers. Carbon prints, consequently, have this in common with the silver print, viz., that the selection of the materials is also responsible for the permanency of the prints.

*(To be continued.)*

Faversham Institute Photographic Society.—The first annual exhibition will be held in the Faversham Institute, on Tuesday, Wednesday, Thursday, and Friday, April 27th, 28th, 29th, and 30th, 1891. There will be a photographic competition confined to members of the Society. The competitive prints and slides will be on view at the exhibition from April 27th to 30th inclusive, in addition to which, in order to make the exhibition as interesting as possible, outsiders as well as members are invited to send in any kind of photographic work for exhibition only. This invitation to outsiders is a new departure, which, we think, other societies, while in their infancy, might copy with advantage. They will, as time rolls on, learn to run alone. Such exhibits to be sent to the hon. secretary, Mr. Frank Crosoer, 13, Market Place, Faversham, not later than 23rd April.

## Notes.

Those whose knowledge of astronomy is limited to a vague conception of the solar system as implanted in their youthful minds at school, are apt to be somewhat disappointed when they see photographs of the planets. They have heard so much of the wedding of the telescope with the camera, and the marvellous results which that union has brought about, that they have been prepared to expect the photographs of Jupiter and Saturn to be as clearly defined as those of the moon, not understanding the great difficulties in procuring pictures of the more distant bodies. Mr. E. W. Maunder, in a paper on "Photography as Applied to Astronomy," recently read before the Lantern Society, dealt with these difficulties in a masterly manner, and reminded his hearers that the very moderate light available did not admit of quick exposures, while the rapid rotation of the planets on their axes prevented those long exposures being resorted to which had been productive of such wonderful results in the case of the fixed stars and of the nebulæ. The photographs, under such conditions, naturally left much to be desired, and could not compare favourably with the records obtained by a skilful draughtsman.

---

The artist has another advantage over the photographer in the delineation of planetary wonders in the use of colour. That this is an important point may be shown by a consideration of the appearance of the ring-girdled Saturn. To the naked eye, this planet is far inferior in brightness and general appearance to either Jupitei or Venus, and we all know how the ancients associated it with the dullness and heaviness of lead. How different it appears in the field of the telescope is well described by the late Mr. R. A. Proctor. He writes: "We turn a powerful telescope on some calm, clear night, when the air is well suited for observation, and we see the most beautiful picture conceivable—a glorious orb, the surface resplendent with the most beautiful colours, blue at the poles, yellow elsewhere, crossed by a creamy white central pelt, and flecked with spots, which, under favourable circumstances, show brown, and purple, and ruddy tints. The most wonderful part of the picture, however, is the amazing ring-system," &c. The beautiful tinted pictures which have been drawn by skilled artists of Jupiter and Saturn must be compared with the photographs—those, for instance, published in Admiral Mouchez's *La Photographie Astronomique*—before it can be seen how the latter fail in rendering a true interpretation of the objects which they profess to portray.

---

In the case of the nebulæ, as Mr. Maunder remarked in his lecture, photography leaves all records founded on visual observations far behind, and the details of photographs taken by Mr. Common and Mr. Roberts have resulted iu a great extension of our knowledge of such bodies. The lecturer did well to illustrate his remarks by the lantern, for he was able to show his audience how, in the case of the planets, the artists were ahead of the camera, and how the latter far outdistanced all competitors in the case of the nebulæ. By comparing the drawings in both cases with the photographs of the same objects, the matter was made clearer than it could have been by any other possible means.

---

Among the capital pictures produced some years ago by the Society for Photographing Relics of old London, was one of the house in Bishopsgate Street occupied in the reign of James I. by a merchant prince, and since sunk to the level of a "public" called, after his name, "The Sir Paul Pindar." It was hoped that this interesting old place, with its projecting stories and carved wooden front, would have for some further time escaped the hand of the destroyer; but modern improvement and the demands of a railway company said no, and Sir Paul Pindar's house has gone. But we were glad to think that someone at least has had the foresight to preserve something more than the photograph for future generations to look upon. The handsome wooden frontage of Sir Paul's mansion is now being erected in the architectural section of the South Kensington Museum, where possibly it will attract more notice than it did in the busy thoroughfare from which it has been removed.

---

It has often been demonstrated that gelatine plates, besides being extremely sensitive to light—as they are expected to be—are also most sensitive to the attentions of less desirable acquaintances. Damp is naturally the most dangerous of these, but cases have been recorded where a strongly smelling compound placed in the same receptacle with a packet of plates has fogged the latter beyond redemption. In one case that we know of plates were sent by parcel post in a box which had contained curry powder, with the lamentable result just named.

---

Messrs. Wratten and Wainwright have recently adopted a means by which such accidents to plates may be altogether obviated. They are supplying a well made tin box in which will tightly fit a packet of their plates of any standard size, and at such a cheap rate that no careful photographer will omit to make use of them. Such boxes, it is evident, will not only be useful for the storage of plates, but will also be invaluable for the safe keeping of negatives, especially as they are of such a form that they cau be stored away in bookshelves. A coat of enamel paint aud a label would make such a mode of preserving one's negatives as neat a one as could possibly be wished.

---

M. Deslandres, the chief of the Spectroscopic Department of the Paris Observatory, confirms Herr Vogel's evidence as to the error in photographs taken by Mr. Fowler at South Kensington of *α Lyræ*, by which this star was made to appear as though it were double. Mr. Fowler's paper, it will be recollected, was read at the Royal Astronomical Society in November, and Herr Vogel's communication was placed before the Society a few weeks ago. M. Deslandres says that a photograph was taken of this star on the same day and at the same hour as that on which Mr. Fowler's photograph was made, and that the line K was thin and single. A Fellow of the Royal Astronomical Society, commenting on the matter, says that the Astronomical Department has, it is understood, achieved photographs of Rigel with certain lines tripled, and it becomes a curious subject of speculation how far they will advance in this direction if the projected railway should pass underneath the building. Perhaps vibration from some cause not suspected gave rise to Mr. Fowler's double effect.

---

In America there seems to be a wider and more general interest taken in astronomy than in England. This is evidenced by the great number of visitors to the Lick Observatory during the summer months. It is open to the public every Saturday night, and, in spite of the great distance from the nearest town (San José, 26 miles), strings of coaches frequently bring up as many as two or three hundred visitors. We are afraid if a proposition were made that the Observatory at Greenwich should be open to the public once a week, a cry of horror would go up from every official, to which the protest made by Sir Joseph Hooker when it was suggested that Kew Gardens might be opened before one o'clock, would be insignificant indeed. Apparently, they manage these things better in America.

---

A visit to the popular places of resort where the itinerant photographer once did most abound discloses the fact that this once popular individual has become very scarce. What may be the reason we cannot say. Perhaps the race is dying out simply for want of renewal from the outside; or it may be that the public no longer care for the pleasures of the ferrotype. In spite of the increase of the number of amateur photographers who are now to be found in almost every class of society, we do not think that the peripatetic operator has suffered from the competition. But whatever the cause may be, the fact remains that the out-door photographic business has of late sadly diminished, and only those firms do a fair amount of trade who possess facilities for taking photographs by artificial illuminants. The novelty of this lends a little attraction, but here it stops, for those who look upon their photographs so taken are not disposed to make a second experiment. The result is frequently too awful.

---

The instructions issued by the Berlin Exhibition authorities in connection with contributions of illustrated books require a little explanation. The invitation to publishers of such works says: "In the case of original work, any kind of reproduction is allowed; in the case of reproductive work, only an artistic form of reproduction is admissible, such as engraving, etching, lithography, and wood-engraving." It will be noticed that photography is conspicuous by its absence. As the instructions stand, they appear to mean that books illustrated by photographic reproductions from original drawings may be exhibited. Other works illustrated by photography are not admissible, because, according to the inference of the wording, photography is not "an artistic form of reproduction." Surely this cannot be intended.

---

The Stereoscopic Company has again paid a five per cent. dividend—not a phenomenal rate of interest on money invested, but, according to Mr. Howard J. Kennard, the chairman of the annual meeting held last week, quite an average one. It is satisfactory to note this, and that the Company's new premises are likely to see an increase in the business. The lift which takes the sitters to the studio has had an exceedingly good effect—a result which is not surprising, as many people, old persons especially, regard the task of mounting four or five flights of stairs an insuperable obstacle. Mr. Kennard says that the new building of the Company, its fittings, decorations, and arrangements, make up "the finest photographic establishment in the world."

---

The necktie camera has received notice at the hands of the *Societé Francaise Photographie*, a paper on M. Block's invention having been read at the last meeting by M. Londe. M. Londe hints at a possible terror in this necktie. He says it has been the reproach of the amateur that he has committed a host of indiscretions with his detective apparatus. With the *photo-cravate* it will be worse, as it will be difficult for the most astute to avoid being caught. As, however, the lens is fixed in the centre of the head of a scarf pin, the only way will be to avoid those persons who wear suspicious looking cravats of this kind.

---

The commencement of the photographic tourist season is foreshadowed by an announcement made at the last meeting of the *Societé Francaise Photographie*, that an enterprising firm had placed at the disposal of the Society labels for attachment to photographic baggage, so as to protect it from the too curious examination of the Custom House officer. The notices contained on these labels are printed in all languages, and all one has to do is to stick them on the place reserved on the sheet of red paper with the black star, which is the design approved by the International Photographic Congress. We presume that such labels are procurable at London photographic establishments; if not, they should be, as their use will save the tourist much trouble. If travellers are wise, however, they will not use their cameras in France. It is quite impossible to know when you are infringing a military regulation.

## THE PHOTOGRAPHIC SCHEME OF THE BODLEIAN LIBRARY.

BY JULIUS F. SACHSE.

Within the last few months renewed attention has been called to the use of photography in the large libraries. All students know the great importance of having valuable manuscripts duplicated photographically. The same applies to important pages of books, rare engravings, portraits, plans, and legal documents, which, by reason of their value, age, or deterioration of texture or fading of the inscription, can be handled or examined only with the greatest care, under the direct supervision of the custodian in charge.

The latest effort in this direction appears to have been made by the management of the Bodleian Library at Oxford, in connection with the University Press. This scheme has been heralded in the daily press far and wide as a solution of the problem, and placing the means within reach of all. But while we agree that it is difficult to estimate the extent to which the usefulness of a library *might* be increased by such arrangements, we cannot refrain from saying that the whole matter as quoted is misleading and impracticable, to say the least, at the ridiculous rates mentioned. Further, the broadcast publication of the matter in the present shape is an injustice and a direct injury to such photographers who make a specialty of that branch of photography, which often requires the highest intelligence in addition to their skill as photographers.

We cannot but think that the parties who formulated the schedule of prices have had but little or no practical experience, either in the line of the average run of library, copying, or in practical photography. We quote the original notice as issued, viz. :—

"The controller of the University Press, Oxford, is prepared to take photographic negatives from MSS., printed books, &c., belonging to the library or deposited there, and to supply prints at the following rates, permission having been first obtained from the librarian :—

| | s. | d. |
|---|---|---|
| For a 10 by 8 negative taken at the library ... | 3 | 0 |
| For a silver print (unmounted) from a 10 by 8 negative ... ... ... ... ... | 0 | 4 |
| For a platinotype print from a 10 by 8 negative (With regard to platinotype prints, the price must vary with cost of the special paper. It will probably increase from time to time.) | 0 | 10 |
| For a carbon print from a 10 by 8 negative ... | 0 | 10 |
| For 20 collotype prints, with clean margins, from one 10 by 8 negative ... ... ... ... | 5 | 6 |
| For 50 collotype prints, with clean margins, from one 10 by 8 negative ... ... ... ... | 9 | 0 |
| For 100 collotype prints, with clean margins, from one 10 by 8 negative ... ... ... | 12 | 0 |

"Estimates for larger sizes or greater numbers may be had on application.

"The sums quoted above are given on the assumption that only *ordinary trouble will be involved* in making the negatives and prints."

If we mistake not, the price for a photographic copy of an ordinary subject in the British Museum and other libraries in England has heretofore been a guinea. In this country the average price has been five dollars—a price which, to an outsider, at first would seem high, but, as will be found in actual practice, it will not pay any competent man to undertake the work for a much less sum.

The writer has probably had as great and varied experience in this line of photography as any one in this section of the country, consequently can speak from experience. Firstly, the work has to be done in the library building, where there are no special provisions for photography, the apparatus having to be sent to the library for the purpose.

Secondly, on account of the great difference in the character of the subjects, often varying from, say, the title of a 24mo. missal to a map 6 by 8 feet, a different apparatus has to be improvised for almost every exposure.

Thirdly, as to the MSS., they require the most careful handling. The parchment is often discoloured and the ink so faded that it is almost impossible to obtain any result suitable for reproduction, the colour values of parchment and writing being almost equal. Then, again, the light is usually a side light, more or less dim, for which allowance must be made. Then, as there are no facilities in the library for development or testing the plates, from two to six plates have often to be exposed on the same subjects in different times, to ensure at least one perfect plate, and prevent the necessity of going over the same ground.

With oil paintings—usually old, cracked, and discoloured—the difficulties are still greater. Assistance is often needed to take down and place into position ; then, again, under the peculiar circumstances, it is often necessary to expose through a colour-filter, thus lengthening the time of exposure from minutes to hours.

The handling of old books—frequently priceless gems, brittle with age and shaky in their bindings—requires the greatest care, and are not to be trusted to anyone with impunity to truss up in front of a camera.

All these little matters mentioned above occur in actual practice. Each subject, it will be found, requires the most careful study and manipulation, which often necessitates a loss of valuable time. In addition, this work requires a degree of judgment and skill which, unfortunately, is not to be found in the composition of every button-presser or amateur-professional who would count himself capable for this branch of photography.

While, at first glance, it would seem to be the easiest matter to photograph the page of a book, the tyro, if he make the attempt with the usual apparatus at the disposal of the average photographer, will soon find that to get the page square upon the plate and properly lit is not near so easy as it seems when we look upon a finished print made by an expert.

It is to be assumed that the authorities in charge of the Bodleian Library have made every provision for development and ordinary copying, securing the best and latest apparatus; but even then they will find that there are many difficulties to be overcome in the practical working of the scheme, not the least of which will be to obtain talent of the order requisite to produce results which will satisfy the patrons of the photographic department, without injury or detriment to the property of the library or museum. Talent of this calibre costs money, and, even without taking into consideration the uncertain demand, and the usual delays from bad weather, which all causes loss, we doubt if they can make the departure a paying success at the formulated rates, unless the management stoop to the questionable plan of assuming that every negative "involves more than ordinary trouble," and then charge accordingly.

## REPORT OF PROGRESS IN SPECTRUM WORK.*

BY PROFESSOR HENRY A. ROWLAND.

DURING the past year or two a great deal of work has been done in the photography of the spectra of elements and the identification of the lines in the solar spectrum, which it will take a long time to work up ready for publication. Hence, I have thought that a short account of what has been done up to the present time might be of interest to workers in the subject. In the prosecution of the work, financial assistance has been received from the Rumford Fund of the American Academy of Arts and Sciences, as well as from the fund given by Miss Bruce to the Harvard Astronomical Observatory for the promotion of research in astronomical physics, and the advanced state of the work is due to such assistance.

The work may be summed up under the following heads:—

1. The spectra of all known elements, with the exception of a few gaseous ones, or those too rare to be yet obtained, have been photographed in connection with the solar spectrum, from the extreme ultra violet down to the D line, and eye observations have been made on many to the limit of the solar spectrum.

2. A measuring engine has been constructed with a screw to fit the above photographs, which, being taken with the concave grating, are all normal spectra, and to the same scale. This engine measures *wave-lengths direct*, so that no multiplication is necessary, but only a slight correction to get figures correct to $\frac{1}{100}$th of a division of Angstrom.

3. A table of standard wave-lengths of the impurities in the carbons, extending to wave-length 2,000, has been constructed to measure wave-lengths beyond the limits of the solar spectrum.

4. Maps of the spectra of some of the elements have been drawn on a large scale ready for publication.

5. The greater part of the lines in the map of the solar spectrum have been identified, and the substance producing them noted.

6. The following rough table of the solar elements has been constructed entirely according to my own observations, although, of course, most of them have been given by others.

I do not know which are the new ones, but call attention to Silicon, Vanadium, Scandium, Yttrium, Zirconium, Glucinum, Germanium, and Erbium, as being possibly new.

Silicon has lines on my map at wave-lengths 3905·7, 4103·1, 5708·7, 5772·3, and 5948·7. That at 3905·7 is the largest and most certain. That at 4103·1 is also claimed by manganese.

These tables are to be accepted as preliminary only, especially the order in the first portion. However, being made with such a powerful instrument, and with such care in the determination of impurities, they must still have a weight superior to most others published.

The substances under the head of "Not in the Solar Spectrum" are often placed there because the elements have few strong lines, or none at all, in the limit of the solar spectrum when the arc spectrum, which I have used, is employed. Thus, boron has only two strong lines at 2497. Again, the lines of bismuth are all compound, and so too diffuse to appear in the solar spectrum; indeed, some good reason generally appears for their absence from the solar spectrum. Of course, this is little evidence of their absence from the sun itself. Indeed, were the whole earth heated to the temperature of the sun, its spectrum would probably resemble that of the sun very closely.

ELEMENTS IN THE SUN, ARRANGED ACCORDING TO THE INTENSITY AND THE NUMBER OF LINES IN THE SOLAR SPECTRUM.

| According to Intensity. | According to Number. |
|---|---|
| Calcium. | Iron (2,000 or more). |
| Iron. | Nickel. |
| Hydrogen. | Titanium. |
| Sodium. | Manganese. |
| Nickel. | Chromium. |
| Magnesium. | Cobalt. |
| Cobalt. | Carbon (200 or more). |
| Silicon. | Vanadium. |
| Aluminium. | Zirconium. |
| Titanium. | Cerium. |
| Chromium. | Calcium (75 or more). |
| Manganese. | Scandium. |
| Strontium. | Neodymium. |
| Vanadium. | Lanthanum. |
| Barium. | Yttrium. |
| Carbon. | Niobium. |
| Scandium. | Molybdenum. |
| Yttrium. | Palladium. |
| Zirconium. | Magnesium (20 or more). |
| Molybdenum. | Sodium (11). |
| Lanthanum. | Silicon. |
| Niobium. | Strontium. |
| Palladium. | Barium. |
| Neodymium. | Aluminium (4). |
| Copper. | Cadmium. |
| Zinc. | Rhodium. |
| Cadmium. | Erbium. |
| Cerium. | Zinc. |
| Glucinum. | Copper (2). |
| Germanium. | Silver (2). |
| Rhodium. | Glucinum (2). |
| Silver. | Germanium. |
| Tin. | Tin. |
| Lead. | Lead (1). |
| Erbium. | Potassium (1). |
| Potassium. | |

DOUBTFUL ELEMENTS.

| | | |
|---|---|---|
| Iridium. | Ruthenium. | Tungsten. |
| Osmium. | Tantalum. | Uranium. |
| Platinum. | Thorium. | |

NOT IN SOLAR SPECTRUM.

| | | |
|---|---|---|
| Antimony. | Cæsium. | Rubidium. |
| Arsenic. | Gold. | Selenium. |
| Bismuth. | Indium. | Sulphur. |
| Boron. | Mercury. | Thallium. |
| Nitrogen (vacuum tube). | Phosphorus. | Praseodymium. |

SUBSTANCES NOT YET TRIED.

| | | |
|---|---|---|
| Bromine. | Oxygen. | Holmium. |
| Chlorine. | Tellurium. | Thulium. |
| Iodine. | Gallium. | Terbium, &c. |
| Fluorine. | | |

With the high dispersion here used, the "basic lines" of Lockyer are widely broken up and cease to exist; indeed, it would be difficult to prove anything except accidental coincidences among the lines of the different elements. Accurate investigation generally reveals some slight difference of wave-length or a common impurity. Furthermore, the strength of the lines in the solar spectrum is generally very nearly the same as that in the electric arc, with only a few exceptions—as, for instance, calcium. The cases mentioned by Lockyer are generally those where he mistakes groups of lines for single lines, or even mistakes the character of the line entirely. Altogether, there seems to be very little evidence of the

* *Johns Hopkins University Circulars*, vol. x, No. 85.

breaking up of the elements in the sun, as far as my experiments go.

Even after comparing the solar spectrum with all known elements, there are still many important lines not accounted for. Some of these I have accounted for by silicon, and there are probably many more. Of all known substances, this is the most difficult to bring out the lines in the visible spectrum, although it has a fine ultra-violet one. Possibly iron may account for many more, and all the elements at a higher temperature might develop more.

Then, again, very rare elements, like scandium, vanadium, &c., when they have a strong spectrum, may cause strong solar lines, and thus we may look for new and even rare elements to account for very many more. Indeed, I find many lines accounted for by the rare elements in gadolinite, samarskite, and fergusonite other than yttrium, erbium, scandium, praseodymium, neodymium, lanthanum, and cerium, which I cannot identify yet, and which may be without a name. For this reason, and to discover rare elements, I intend, finally, to try unknown minerals, as my process gives me an easy method of detecting any new substance or analysing minerals, however many elements they may contain.

The research is much indebted to the faithful and careful work of Mr. L. E. Jewell, who has acted as my assistant for several years. Preliminary publications of results will be made in the *Johns Hopkins University Circulars*.

Among the latest results, I may mention the spectroscopic separation of yttrium into three components, and the actual separation into two.

## HYDROQUINONE *VERSUS* EIKONOGEN.

We have noted lately a considerable amount of discussion in the foreign journals about the relative merits of hydroquinone and eikonogen. Two French experimenters, Balagny and Reeb—the former on hydroquinone, the latter on eikonogen—have been making quite a number of tests that are of special interest to the working photographer. Balagny says that he has been using hydroquinone for two years,and has found its reducing power so great that he has not had to abandon it once since he has studied it. But he also says that the first formulæ given when the hydroquinone was introduced caused two difficulties: first, the bath soon became brown and stained the negative; and second, the development with a new bath produced hard negatives. After experimenting on these difficulties, M. Balagny has come to the conclusion that the carbonates of the alkalies are responsible for the colour of the negative, especially sodium carbonate, while the hardness of the results is due to alkaline carbonates generally. To overcome these defects, he recommends the use of caustic potash as an alkali. The formula given consists of two parts, as follows:—

*Solution* No. 1.

| | |
|---|---|
| Sodium sulphite ... ... ... | 250 grammes |
| Water ... ... ... ... | 1,000 c.c. |

Dissolve with heating, and add—

| | |
|---|---|
| Hydroquinone ... ... ... | 20 grammes |

*Solution* No. 2.

| | |
|---|---|
| Potash (by lime or by alcohol) ... | 100 grammes |
| Water ... ... ... ... | 900 c.c. |

After solution is complete, add the following mixture, which is best made with heat:—

| | |
|---|---|
| Potassium ferrocyanide ... ... | 50 grammes |
| Water ... ... ... ... | 100 c.c. |

This last gives softness, and preserves the whites.

It is also well to have on hand a 10 per cent. solution of potassium bromide.

The method of using these solutions is as follows:—For a plate 13 by 18 centimetres (5 by 7 inches) take—

| | |
|---|---|
| Solution No. 1 (hydroquinone) ... ... | 80 c.c. |
| Bromide solution ... ... ... | 1 ,, |
| Water ... ... ... ... ... | 40 ,, |

This constitutes the developing bath for instantaneous exposures.

The above mixture is poured over the plate in the developing dish, and allowed to remain till the film is thoroughly soaked—say thirty seconds. The fluid is now poured out of the dish into another vessel, and 2 c.c. of the potash solution No. 2 are added, and the mixture returned to the plate in the dish. Allow the fluid to act on the plate a few seconds to see if the image will appear. If the image does not appear, add another 2 c.c. of the alkali and wait again for the appearance of the image, adding the solution in this manner until the picture just begins to appear; the development will now proceed without farther additions. As a means of bringing out the last details in the shadows, 2 c.c. of the alkali solution may be added when the development appears complete to the eye.

The bath given above will develop one dozen negatives if care is taken. After use the bath should be returned to the bottle, and the latter carefully closed for exclusion of air. To start the development of a new series of instantaneous exposures, a bath may be made as follows:—

| | |
|---|---|
| Bath already used ... ... ... | 60 c.c. |
| Solution No. 1 ... ... ... ... | 60 ,, |

The addition of bromide is not necessary, as the bath contains enough from the former development; but solution No. 2 must be added with the same care as before, using only 2 c.c. at a time until the high lights begin to appear. This last bath will answer for a new lot of exposures.

For time exposures the bath is made up as follows:—

| | |
|---|---|
| Solution No. 1 (hydroquinone) ... ... | 40 c.c. |
| Bromide solution ... ... ... | 4 ,, |
| Water ... ... ... ... ... | 80 ,, |

The method of using is exactly the same as with instantaneous exposures, always searching for the limit of development, the additions of No. 2 being always 2 c.c. at a time.

Working in a somewhat different line of research, M. Reeb has determined, by a series of careful experiments, the best proportions to mix the hydroquinone with sulphite of sodium and potassic hydrate to give the most satisfactory results in development. For this purpose, he determined the actual reducing power of hydroquinone upon a given quantity of silver oxide, also the best quantities of alkali or alkaline carbonate to use under these conditions, and, at the same time, the quantity of sulphite of sodium for the best working of the developer. Taking silver nitrate as a standard, he found that 0·08 grammes of hydroquinone would reduce 1 gramme of the salt. In the case of sulphite, he found the use of too much was injurious, and finally came to the conclusion that the following proportions are the best to use:—

*Hydroquinone and Potash.*

| | |
|---|---|
| Hydroquinone ... ... ... ... | 1 gramme |
| Potassium hydrate ... ... ... | 1 grammes |
| Sodium sulphite ... ... ... | 7·5 ,, |

*Hydroquinone and Carbonate.*

| | | |
|---|---|---|
| Hydroquinone | ... | 1 gramme |
| Sodium carbonate | ... | 10·5 grammes |
| Sodium sulphite | ... | 5 ,, |

If other alkalies are desired, they may be used in the following proportions:—

| | | |
|---|---|---|
| Sodium hydrate | ... | 2·85 grammes |
| Potassium carbonate | ... | 4·92 ,, |

To be used with 1 gramme of hydroquinone.

Applying the same set of tests to eikonogen, M. Reeb found that 1 gramme of silver nitrate requires 0·33 gramme of this developer to completely reduce it, together with the same quantities of the alkalies found necessary for hydroquinone. As with the last compound, sulphite of sodium affects the development within certain limits. A mixture of sulphite and eikonogen without alkali will have some reducing power, but the action will be slow. Using the sulphite as a preservative of the eikonogen, five parts of the salt are needed for one part of eikonogen. If, on the other hand, an alkali is used, this amount is increased to ten parts.

Commenting on the results obtained in these experiments, M. Reeb comes to the conclusion that hydroquinone is better than eikonogen, and he gives the following formulas for comparison.

To reduce 1 gramme of silver nitrate, using hydroquinone, the following proportions are required:—

| | | |
|---|---|---|
| Hydroquinone | ... | 8 grammes |
| Potassic carbonate | ... | 40 ,, |
| Sodium sulphite | ... | 40 ,, |
| Water | ... | 1,000 ,, |

Using eikonogen, 1 gramme of silver nitrate requires:—

| | | |
|---|---|---|
| Eikonogen | ... | 33 grammes |
| Potassic carbonate | ... | 40 ,, |
| Sodium sulphite | ... | 300 ,, |
| Water | ... | 1,000 ,, |

It will be noted that, in the last formula, there is four times the amount of eikonogen that there is hydroquinone in the first. In the last formula the sulphite is eight times that used in the first.

M. Reeb acknowledges that hydroquinone is slower than eikonogen, but only under the ordinary conditions, and not when used properly. As a rule, its action is retarded by the use of too much sulphite.

Drawing our own conclusions from the above-mentioned results of both experimenters, we should say that the developer of Balagny, with a reduction of the sulphite to 150 grammes, would prove the most desirable to use, and his method of development is one that we can strongly recommend from our own experience. The use of ferrocyanide was advocated by Captain Eugene Himly in the "International Annual" several years ago, and Dr. Eder and Professor Lainer, of Vienna, have confirmed his results quite recently.

When the question of economy is of no importance, a mixture of hydroquinone and eikonogen will be found very effective, but the hydroquinone alone is only a trifle behind it when used with potassic hydrate.

Now is the time for the amateur to experiment with developers, and not wait till the fine weather comes. For him we would strongly recommend an attack on the hydroquinone and eikonogen question on the above lines. —*Anthony's Photographic Bulletin.*

Photographic Club.—The subject for discussion on April 8th will be, "The Development of Instantaneous Exposures"; April 15th, "Printing on Emulsion Papers."

## STEREOSCOPIC PHOTOGRAPHY.

BY EDWARD D. LEDYARD.

I am glad to see that this most beautiful of all the accomplishments of photography is taking a rise and becoming popular again. Personally, I use only a stereoscopic camera. My wife has protested against getting any more frames in our house, and the 8 by 10 camera has been laid on the shelf. She thought perhaps she would henpeck me a little when she issued this mandate, but, on the contrary, she was leading me to greater enjoyment than I had ever had in my "crank" before. I am glad, however, that I began to make 8 by 10 pictures first. The knowledge which I thus gained in the choice of subject and in lighting and expression is invaluable to me in the production of stereoscopic pictures. I give just as much thought and just as much work in the selection of a stereoscopic view as I did with an 8 by 10, and I do not know but what a little bit more. Since my number of negatives has largely increased, I begin to suspect my wife of having a larger knowledge of things, for, to use her own remarks in the matter, she "finds the stereoscopic views very helpful on many occasions."

To begin with, we have two very excellent hand-stereoscopes. If we have children to manage, or if we have company, the hand-stereoscopes are brought out, the views are divided among them, and the parties are kept busy and amused and interested by looking at them. Indeed, I have grown to believe that nothing that photography can produce can give one-half the pleasure that a good stereoscopic view does.

As an amateur, I find or discover qualities or points in my results which I did not dream were there until I saw the prints in the stereoscope. I use a 5×8 plate, from one end of which I can print my lantern slides, or I can print single pictures and mount them on small cards and make them acceptable presents to my friends, when I feel that I have been smart enough to secure a view that is worth diffusing. Of course, this is about as much as an amateur can see in stereoscopic photography, but during the last summer's season I was taught a great deal more from somebody else. I happened to be on the portico of an hotel down on Long Island, when not a book-agent but a seller of stereoscopic views—or, if you choose to call him so, a stereoscopic-view agent—came along. He had a pack of boxes, each one containing a stereoscope, in one hand, and a heavy satchel containing views in the other. He opened his pack on the portico and worked the resorters there for all they were worth. I was surprised to learn that some of the people there had never looked through a stereoscope, not to say owned one. They have ceased to sin in this direction. The young man converted them. They are now the happy possessors not only of a stereoscope, but have made a good beginning toward a collection of views. One of them, who is my neighbour and who leads a leisurely life, has become "insane" on the subject. He says he is "going to have a stereoscopic view of every subject which it is possible to obtain." I know that a few years ago there were many people insane in the same direction. They had large and wonderful collections. I predict that the same thing is coming about again. The stereoscopic view is coming into fashion, and it is coming back to increase. It is to be the future of photography, out of doors as well as in doors. The facilities afforded by the dry plate of to-day enable the photographer to make stereoscopic portraits without number. I have made a few attempts in this direction, and they are perfectly charming. It is almost life to see one of your children, or one of the older members of the family, standing out round and full and life-like, as they do under the magic influence and power of the stereoscope. "By the gods, I never saw anything so fine," was the expression of an enthusiastic veteran friend, one who had travelled over a good portion of the world, as he looked at some of my stereoscopic portraits. Every day I grow more and more of the opinion that the good old chappie was right. If I dared to make another prediction, it would be that stereoscopic portraiture is the direction in which the photographer who is complaining of "bad times" should work. Take pains, use a good stereoscope with prisms sufficiently large to cover the picture, and take my word for it there is money in it.—*Wilson's Photographic Magazine.*

## Patent Intelligence.

### Applications for Letters Patent.

5,141. William Tylar, 12, Cherry Street, Birmingham, "Improvements in Photographic Dark Slides."—March 23rd.

5,218. George Percival Spooner, 8, Quality Court, London, "Improvements in Photographic Cameras."—March 24th.

5,284. Henry Hodgetts and William Wallace Beasley, Claremont House, Claremont Road, Handsworth, "Improvements in Photographic Change-Boxes for Flexible Films." —March 25th.

5,298. Thomas Davidge Ashplant, 50, John New Road, Clapham, London, "Application of Talc or Mica as a Substitute for Glass, Celluloid, Paper Films, and other things now in use for Photographic Purposes, Dry Plates, Transparencies, and Lantern Slides."—March 25th.

5,361. Joseph Bradley, 53, Arcade Chambers, St. Mary's Gate, Manchester, "Improvements in Photographic Cameras." —March 26th.

5,385. Edwin Howard Jaques, 41, Temple Row, Birmingham, "Improvements in Hand or Detective Photographic Cameras." —March 26th.

### Specifications Published.

2,034. *Feb. 7th,* 1890.— "Walking-stick Camera Tripods." Archibald Griffin Rider, 11, Jewry Street, Winchester, Hants.

This invention relates to that class of tripod camera stand which is made in the form of a walking-stick for convenience in taking about.

It is composed of preferably three sections or legs, in or upon each of which slides an extension piece, preferably at the top end, in which case the extension pieces are jointed together so as to allow of the legs being extended to secure a firm basis. The plate to which the legs or extension pieces are jointed may be provided with a screwed or other pin upon which the camera may screw direct, or upon which a suitable plate may be screwed for the camera to rest upon.

Any convenient form of sliding arrangement may be provided for the extensions, but I prefer to form a suitable slot in the leg, and shape the extension to the proper curve on the outside, so as to complete the circle of the walking-stick while its inner face is cut at the proper angles, so that when close together the inner faces of the three extensions may fit as required. When the extension passes entirely through the substance of the leg, I prefer to bind the latter with one or more bands, preferably of brass, so as to keep it sufficiently strong, and any suitable form of stop may be provided to prevent the extensions from pulling out altogether, or to return them in their closed-up position. Such a stop may either be a positive stop, as a projection provided upon the extension, or it may be effected by having the inner end of the extension too large to pass the band already mentioned.

The cap which closes all in at the top, and forms an ornamental head or handle to the stick, I prefer to form hollow so as to slip over the joint plate, and arrange it to screw on to the screwed pin previously mentioned.

At the bottom end any suitable form of ferrule may be provided to hold the ends together and protect them, and this may be secured by any suitable form of stop, or, if desired, may be formed into sections, and I prefer to slip a metal ring up the stick, which, being preferably tapered, will provide a bearing for the ring in the proper place.

14,004. *Sept. 5th,* 1890.—"Cameras." Charles Cope Gill, 5, Hornsey Rise, London, Photographer; and James Gentry Evans, 70, Sunnyside Road, Hornsey Rise, London, Builder.

Our invention relates to improvements in photographic cameras of the class known as detective, hand, or box cameras, and has for its chief object mechanism for storing and exposing the sensitised plates.

In carrying our invention into practice, we form our box camera of two parts, or receptacles, hinged together. The front part is divided horizontally in two compartments by a centrally-slotted partition. The upper compartment contains the bellows and lens, and has a flap or shutter at the back moved by a small handle projecting on the side of the front receptacle; this flap or shutter discloses or shuts off the light. The lower compartment is used for storing an additional number of plates or other requisites. The rear receptacle is closed in front by a double-jointed dark slide capable, when withdrawn, of being folded over the back of the said receptacle. The latter contains a sliding case formed of a lower enclosed compartment, and of an upper and open part whereat the exposure takes place. The lower or dark compartment is furnished at each side with an equal number of corresponding guides, between which the sensitised plates can move up and down. These plates are inserted between the inwardly curved and longitudinal edges of metallic plates designed to protect them, at the back. To the end of the rear receptacle is hinged a bar passing through the end of the sliding case, and which, when the said case is pushed back home into the receptacle, it extends over its lower compartment and carries in that position the sensitised plates ready for exposure. When the sliding case is withdrawn from its receptacle, the above bar is likewise drawn back from the dark compartment, when, by reversing the apparatus, the plates are dropped in the upper part of the case, and, by turning the latter back, the bar is moved over the dark compartment, so that when the apparatus is brought back into its original position, these plates rest, as above stated, upon the said bar, when, the two parts of the apparatus being connected, the dark slide raised, and the flap or shutter open, the exposure of the foremost plate can take place.

When this is effected, the sliding case is moved slightly forward so as to drop the exposed plate between the front guides of the dark compartment below. The next plate can now be exposed, the above operation being repeated until all the plates have been exposed. The motion of the sliding case is effected by a rack-and-pinion, the latter being operated from the outside. A dial, indicating the number of exposed plates, is attached to the rear receptacle. The bellows and lens can be moved to and fro by a lever pivoted thereto, the pivot passing through the slot of the partition aforesaid, while the lever passes through another slot formed in the side of the apparatus so as to be operated from the outside.

The apparatus is closed in front by a lid hinged centrally and carrying a finder inside. The camera may be carried in the hand or used on a stand.

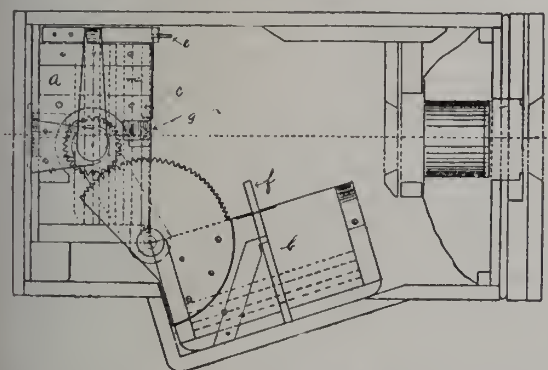
As our improvements are capable of some modifications without departing from the principle thereof, we do not restrict ourselves to material, dimensions, or to the precise form or placement of the several parts thereof.

16,778. *October 24th,* 1889. — "Improvements in Photographic Cameras, and in Apparatus connected therewith." Samuel Dunseith McKellen, 3, Chapman Street, Manchester.

The first part of my invention has for its object an easy means of carrying any convenient number of plates in one storage box, so that they may be exposed one after another, and an easy means of transferring the exposed plate from its position in the storage box into a separate receptacle.

A chamber or magazine is provided at that end of the camera which is opposite to the lens. This chamber is made to contain any convenient number of plates, preferably one or two dozens, the sensitive films being towards the lens. The plates are pressed forward against a frame by suitable springs, which exert sufficient pressure at the back of the plates to ensure that the front one shall be always kept in proper register. The tranferring of the front plate, after exposure, to the receiver may be effected in the following manner:—

The receiver is in the form of a box without a lid, which lies in the bottom of the camera, and is swivelled or hinged by one end or side, close to the front of the magazine, in such a way that it may be closed up against the front of the magazine, the open side of the box being next the magazine. The frame before mentioned, which forms the register, separates the magazine from the box. This closing up may be effected by any suitable mechanical contrivance. The register frame is formed by a rail from top to bottom on each side in front of the magazine. The plates are contained in metallic sheaths, which cover the back, clip the edges, and slightly overlap the film. These sheaths have projections at the sides, two or four or any convenient number. These projections rest upon the rails which stand clear of the sheaths. The rails have gaps cut in, corresponding in number and relative position to, but slightly above or below, the projections on the edges of the sheaths. Now it is clear that if the magazine is turned up so that the front plate faces downwards, and the front plate is slided along until the projections enter the gaps, the plate and its sheath will fall through into the receiver below, and the second plate will assume the position formerly occupied by the first—the projections of its sheath resting upon the solid parts



of the rails. The receiver will then be returned to its normal position on the bottom of the camera. The plates lying face downwards in the receiver are protected from light by the sheaths, and an additional protection can be provided.

The second part of my invention is to provide a cover for cameras of all kinds which have to be carried about. This cover is intended to dispense with the use of a carrying case. For this purpose, I employ any material of which camera cases are usually made. I cover the base-board of the camera with the material, attaching it by means of studs placed in a convenient position, or by any convenient means. I make an opening in the centre of the material corresponding in size to the turntable in my camera, or large enough to allow a triangle to be screwed to the base-board, or with only a small hole through which a base-board screw may pass. I make this material of such size and shape that it will fold over and cover all of the camera when it is folded up. It can then be fastened by buckles, or in any convenient way, so as to appear as if the camera were in a case.

The advantage of this cover is that the camera can be mounted on its legs and, the cover being unfastened, the camera can be opened, leaving the cover still attached to the base-board; the camera, cover, and legs attached can then be carried about when photographing from one point of view to another much more easily, as there is no empty camera case to handle.

# Correspondence.

## THE NEW RAPID IRON PROCESS.

Sir,—It is curiously suggestive of the difficulty that may beset historians, that there should already be a question as to the personality of the originator of the extraordinarily sensitive iron compound which was announced a fortnight since by Mr. Meldola as having been discovered by Mr. F. Varley.

It has already been suggested that—assuming the accuracy of the statements by Mr. Mendola and Mr. Varley that no silver is employed—this invention is the most important that has for many years appeared in photography, and that a process in which the sensitiveness of an iron compound is exalted to that of a silver bromide emulsion, need not be limited to printing, but may be applied to the camera, with possibly an acceleration of even our present exposures. The desirability of settling the origination of the process is therefore obvious enough, and, at this early stage, should not be difficult.

Mr. Meldola, in introducing the discovery, attributed it to Mr. Varley without mentioning any other name. Mr. Varley, who was present and demonstrated the sensitiveness of the compound by exposing under a negative for a second or so to gaslight, and then developing the print, did not contradict Mr. Meldola's statement, with which, too, the report in the Journal of the Society of Arts and other papers is in accordance. The Editor of the Photographic News, however, in last week's issue, speaks of a contemporary, *Nature*, as being in error in attributing the discovery to Mr. Varley, and names Mr. Friese Greene as the originator. Doubtless this exclusive information is not given without good authority, which may be adduced in the interest of photographic history, and perhaps Mr. Varley would wish specifically to disclaim the origination of the process, and explain why this was not done when he was credited with it by Mr. Meldola.

*March 31st.* W. E. Debenham.

## HOUGHTON'S AUTOMATIC HAND-CAMERA.

Sir,—In your notice of our automatic hand-camera exhibited on the 24th inst. at the Photographic Society, there are two errors which we should be glad if you would correct in your next issue.

It is the front plate that is moved to the back by the changing arrangement, and, what is more important still, the extra depth required is scarcely more than $\frac{1}{8}$, instead of $\frac{3}{4}$, as reported. G. Houghton & Son.

89, *High Holborn, London, W.C., March 26th.*

## THE STORM IN THE NATURALISTIC CRATER.

Sir,—When I wrote my book, I did not write it for my own glorification, but purely and simply with the intention of trying to help the photographic world to give the fullest expression to the very limited art that they practised. I was justified in thinking I might help them by the attention which my own photographs had received in the photographic world. I regretted the loss of several months' work which the preparation of the book cost me, but the spirit of the reformer was strong in me, and it had to find expression. I have since learned that in art matters all attempts to bring others to think as you do are hurtful rather than useful. However, to return. I distinctly stated what claims I thought I had to originality. I claimed that I had attempted to reduce naturalistic teachings (which I said were as old as ancient Greece) to *scientific first principles*, and *to apply those teachings to photography*. That was my claim. I still claim and can prove as much, but I am not so greedy for a character for originality as those "who break new ground in the land of Constable."

The study of development and of new scientific discoveries, psychological and physical, obliged me to renounce my former views, and determined me to break a conspiracy I had long watched with amusement—a conspiracy of which I shall one day write a full history, if only as a study of character.

Amid all this turmoil arose a whisper that I had got some of my ideas from a certain book—I refer to "Naturalistic

Painting." As a matter of dates, my first writing on the subject came first ; as a matter of incidental proof, I mentioned the receipt of a letter. Busybodies have now been round trying to make mischief, but they shall not succeed. Mr. Bate shall see the letter, and its author will explain the matter to me and to Mr Bate, and the misunderstanding shall be removed. This is no public matter, but one which concerns us three only. My writings take precedence of those of Mr. Bate by date. The suggestion that Mr. Bate was in any way influenced by me I have already publicly repudiated. Every day that I live and grow to see art matters more clearly, I deeply regret I was ever in any way identified with Naturalism.

P. H. Emerson.

THE FEDERATION SCHEME.

Sir,—I notice in the report of the meeting *re* the proposed federation scheme, held on the 23rd March last, that my name is mentioned as having been elected a member of the committee. As this was done without my knowledge or consent, and not having been present at any of the meetings, I must protest against this irregular proceeding, and decline to recognise the appointment. Moreover, the greatly increased duties caused by the rapid growth of the South London Photographic Society occupy all my spare time and attention. I do not feel justified in accepting any further responsibilities. F. W. Edwards.

*87, Bellenden Road, E. Dulwich, S.E., March 28th.*

# Proceedings of Societies.

London and Provincial Photographic Association.

*March 25th.*—Mr. T. E. Freshwater in the chair.

The report of the delegates appointed to attend the meeting on the subject of the proposed federation of the London and Suburban Photographic Societies was received.

Mr. A. S. Newman read a paper on "The Measurement of the Speed of Shutters." At the conclusion of the paper, replying to various questions form the members, Mr. Newman said one of the plans he had adopted was to photograph a plate pierced with a certain number of slots moving at a known speed backwards and forwards in front of the camera. By this method he had no difficulty in calculating the speed of a shutter up to an exceedingly small fraction of a second. With a shutter working at 200th part of a second, he estimated that $\frac{1}{50}$th of a second was occupied before the shutter attained its maximum speed. He drew a diagram on the black-board of a shutter he had made. It consisted of a circular plate, from which a section had been cut to form an opening, and made to revolve in front of the lens aperture, controlled by a small piston rod. With one inch aperture a speed of the 750th of a second was easily attained.

Reference was made to a method of direct measurement adopted by Mr. A. Haddon, which gave great accuracy, consisting of a bristle attached to a tuning-fork, and allowing it to trace a curve on a smoked glass surface during the time the shutter was moving.

Mr. Newman explained, by the aid of the black-board, a method of measurement he had employed. A pendulum having an arm fixed at right-angles at the top of it, carrying a bristle, is made to swing in front of a piece of smoked glass, travelling in a lateral direction, and a calculation made from a measurement of the curves produced by the bristle.

Putney Amateur Photographic Society.

*Wednesday, March 25th.*—Mr. T. Gilbert in the chair. The members and friends of this Society spent a most enjoyable evening witnessing an exhibition of some 200 slides, the work of the following members :—Messrs. Congreve, Fauckue, Gilbert, Gorni, Macdona, W. and G. E. Martin, Ovey, and Ballard. The lantern was manipulated by Mr. Ovey.

The "Repeater" hand-camera was shown and explained.

The next meeting will be held on April 8th, when the American slides will be shown.

Photographic Society of Ireland.

A technical meeting was held on Thursday, 26th ult., Mr. H. Bewley in the chair.

A paper on "Some Printing Processes" was read by Mr. M. Hedley, who treated the subject exhaustively, and exhibited a large number of prints in silver, gelatino-chloride, ferro-prussiate, platinotype, bromide, and diazotype. Mr. Hedley advocated the use of green glass for printing, as giving a pluckier picture with a greater amount of detail, and stated that it was pre-eminently suited for matt surface paper. In support of his theory, he exhibited some pictures which were equal in every respect to platinotype prints.

North Middlesex Photographic Society.

The first outing took place on Monday to Rickmansworth. The subjects chosen were Moor Park, the beautiful seat of Lord Ebury, with its magnificent trees and herds of deer. The canal at Rickmansworth and adjacent rivers up to Harefield afforded lovely bits for over one hundred plates. Mr. Chang, with his hand-camera, was well to the front.

The Sheffield Camera Club.

A general meeting was held on March 25th, in the Lower Montgomery Hall, the president, Mr. G. T. W. Newsholme, F.C.S., in the chair.

Prof. J. O. Arnold, F.C.S., gave a lecture entitled, "Through North Devon with a Camera," illustrated by slides from negatives taken by himself. Starting from Liverpool to Swansea, thence to Ilfracombe, the tour was graphically described, and many places of interest connected with Kingsley's "Westward Ho!" and Blackmore's "Lorna Doone"—Bideford, Clovelly, Lynmouth, and the famed Doone Valley—were beautifully portrayed, although most of the negatives were taken in heavy rain.

A number of new members were elected, and others nominated.

Bath Photographic Society.

*March 25th.*—Mr. W. Pumphrey in the chair.

Marion's "Radial" hand-camera was shown and explained by the Secretary, and negatives taken that afternoon by its means were on the table. Bain's "Crown" shutter, also sent by Messrs. Marion and Co., was handed round.

Mr. C. Cloakley exhibited half-a-dozen printing frames he had constructed in various ways to secure certain advantages, among them being lightness, ease of manipulation, freedom from shifting the backs during examination, the backs built up of three boards glued up across the grain dowels alternated at fixed points, &c.

Mr. A. G. Bristow showed the hand-camera used by him to secure the pictures awarded the medal at the Liverpool Exhibition. It was a rectangular dark box in which he had fitted an Eastman roll-holder, a Wray lens, and a Caldwell shutter, the latter being released by a pneumatic ball outside the box. Mr. Bristow said vibration was much less marked when a hand-camera was so fixed, than by pressing a spring lever or any such contrivance. A number of prints illustrating the work of the camera were exhibited, including those awarded the medal.

Mr. Pumphrey said he had experimented with the Watkins' exposure meter, which he considered a valuable instrument.

Messrs. Perren, Wilkins, Appleby, and the Secretary also made remarks to the same effect.

Newcastle-on-Tyne and Northern Counties Photographic Association.

A meeting was held on the 24th March in the Mosley Street Café, Newcastle, when Mr. A. S. Stevenson presided.

The honorary secretary, Mr. Edgar G. Lee, read the eleventh annual report of the council, who congratulated the members upon the exceedingly prosperous condition of the Association. The members now numbered upwards of 120. The principal event of the year was the photographic exhibition in the Central Exchange Art Gallery, which was in every respect an unqualified success. About 1,200 frames were hung, representing the work of 110 exhibitors. So far as quality was concerned, it was admitted on all hands that the exhibition had never been surpassed. One practical result was an immediate and, it is to be hoped, permanent large increase in the Association's membership. The main object of the exhibition was to give a stimulus to local photography, and to afford members and the public an opportunity of seeing the work of the best men of the day. The council felt satisfied that this object had been carried out. The Society had acquired an excellent optical lantern.

The financial statement, presented by Mr. J. W. Robson, showed that the Association commenced the year with a balance in hand of £2 13s. 3d. The subscriptions had amounted to £33 0s. 11d.; the expenditure had been £30 10s. 6d.; and there was a balance in hand at the end of the year of £5 13s. 9d.

The Chairman, in moving the adoption of the reports, which was agreed to, congratulated the members upon the healthy condition of the Society. There was a suggestion that they should have a club room, and he would like to see that idea carried out. They who were amateurs must acknowledge their indebtedness to the generous assistance given to them by the professional photographers.

A discussion ensued on "Bromide Printing."

---

### Photographic Society of Philadelphia.

At a meeting held on Wednesday, March 11th, the president, Mr. John G. Bullock, occupied the chair.

A report from the committee on lantern slides was read, relating to the public exhibition held at Association Hall, when one hundred and ninety-one slides were shown by fifty-one members.

Dr. Mitchell opened the subject announced for discussion, "Dark Room Illumination," and exhibited a lantern which he used in his own dark room. The general objection to the illumination of a dark room by means of coloured light, particularly ruby light, was that, in a short time, it generally affected the retina very injuriously, and really produced a form of congestion. It acted very strongly on the eyes of individuals whose retina was a little more sensitive to the colours to which one is limited in the dark room. The light was generally thrown directly in the face of the operator, or very nearly so, so that, while looking at the plate, he received, more or less, the red rays in his face. To develop a plate, an operator did not need the light in his face—he wanted it on his plate; hence, after some consideration, he had had constructed for his own use the lantern now exhibited, in order to concentrate the rays solely upon the plate. The lantern was a square tin box, with the ruby glass inserted in the bottom. The intention was to suspend the lantern above the developing tray, all light thus being shut out directly from the eyes of the operator. The light was furnished from an argand burner. The Doctor stated that he had worked for five or six hours at a stretch with this lantern without feeling any more effect than if he had been reading a book by ordinary lamplight.

For the purpose of overcoming the shadow caused by the lighting apparatus, the President stated that he had used a lantern similar to the one shown by Dr. Mitchell, arranged for the gas to come in from the rear. He used a large fish-tail burner, placed parallel with the glass, and by that means avoided shadow.

Dr. Mitchell suggested that the most perfect thing would be a ten or fifteen candle-power incandescent burner, which one could readily turn on or off, as desired.

Mr. Carbutt next referred to the lamp he used while travelling last summer. It was constructed on the same principle as the one shown by Dr. Mitchell, but in place of glass ruby fabric was used. He found it very convenient, as he could buy a candle almost anywhere.

Mr. Bell said that on his trips he never used a light at all. He closed up his room and changed his plates in the dark.

Referring to the method of development in ordinary light by means of Nuktigonia, a developing fluid, Dr. Mitchell said this was a solution of a very strong orange-coloured aniline dye, and the plate had to be placed in the solution in the dark room, or in some way by which actinic rays could not reach it, but after that development could be conducted without any trouble. Some of the members might be astonished to learn that a plate of ordinary sensitiveness, after development had been pretty well carried on—particularly pyro development—could be taken out in a strong light, and the plate finished.

Mr. Cheyney said there was one fact relative to light which was not often taken into consideration, and that was the operator's distance from it. The lantern he had was very convenient for developing, but the rest of the room was too dark to lay one's hand on a bottle or anything that might be wanted. To obviate this he had a lamp placed about eight feet distant, to which was affixed a ruby chimney. This he found he could burn with impunity and have lots of light. None of his plates had been fogged by it, and he always used as fast plates as he could get.

Mr. Rau described an apparatus made by him for use while travelling in the East with Mr. Wilson. It consisted of a cylinder made by rolling several sheets of Carbutt's ruby paper on a stick. Whenever he desired to change his plates, he stood this cylinder over a light placed in a box lid, and though it lit up the whole room, he never lost or fogged a plate. Of course they did not then use as rapid plates as at the present time. The cylinder did not break, and the same sheets were used during the whole journey—six months probably. The light used was a candle, and the top of the cylinder was turned over.

Mr. Chapman described a method of lighting the dark room from outside, thus avoiding the discomfort from heat and exhausted air. The lamp could be easily placed on the window-sill outside, and the coloured fabric against the glass, made to fit closely to the window frame.

Mr. Ives said he had several dark rooms in use, and wherever he used artificial light, he placed it immediately outside the window of the dark room, so that all the heat was out of the way.

The Secretary suggested that a shelf under the developing table was a very good way to cover up the plate. It was always there when wanted, and saved the trouble of hunting in the dark for covers, which could not be found when most wanted.

Mr. Ives used a hinged lid for this purpose, which he turned down over the developing dish when he desired to cover the plate. He found it very convenient.

Mr. Earle showed an improved form of "diffuser" for flash-light exposure. It was the invention of a Mr. Bridges, of Baltimore, and consisted of a base of tin about 12 by 18, at one end of which was hinged a tin reflector of same dimensions, and at the other a frame holding a thin sheet of white, translucent celluloid. The flash-lamp, of any usual form, was placed in the middle of the base board, the light being reflected through the celluloid, which diffused it in a very perfect manner without materially lessening its actinic power. Everybody predicted that the celluloid would burn up at once, but a very careful test had been made, and they found that the material could even be waved through a gas flame without ignition. It would ignite only when held still in the flame. Considerable heat was necessary to start celluloid to burning. If a little common salt were added to the magnesium it would give a yellow flame, and by the use of an orthochromatic plate very soft effects could be obtained.

---

### The Photographic Society of Japan.

A meeting of the above mentioned Society was held in the rooms of the Geographical Society, Nishikonyacho, Tokyo, on the evening of Friday, 13th inst., Mr. Edmond R. Holmes in the chair. Tnere was a large attendance.

A paper was read by Mr. T. Ichioka on a certain developer that had fallen into his hands. This developer was sold commercially in the form of a bright red solution, needing nothing but dilution with water. It was exceedingly active, and could be used over and over again. It contained a large quantity of sulphite of soda, and some caustic soda, but Mr. Ichioka did not know what was the actual developer.

Mr. C. D. West thought that the actual developer was probably hydrokinone. Either pyro or eikonogen would be detected by the colour, in spite of the fact that some dye, probably an aniline colour, had evidently been added to the solution to make it more difficult to guess what it might be made up of.

Mr. W. K. Burton demonstrated the washing of eikonogen that had turned quite black. By the particular method of washing adopted, the loss of eikonogen was a mere trifle.

Mr. B. Munster showed some tubes of the new eikonogen developing powder. This powder was found to be quite white, and, when dissolved in water, gave a colourless solution. Mr. Munster said that it needed no addition of any kind, and was a most active developer.

A portfolio of prints that had been sent to the Society some time ago by Dr. H. P. Emerson, as examples of "Naturalistic Photography," were handed round for criticism.

Mr. K. Ogawa said that, when he was in America, he had taken every opportunity of studying reproductions of the work of the French artist, Millet, whose pictures he admired greatly. It was evident that Emerson was trying to imitate his work photographically, and, although Emerson's work was far from faultless, it was, Mr. Ogawa considered, a great deal better than what was commonly turned out by photographers, who might study Emerson's work with advantage.

Mr. C. D. West said he thought the greater part of Emerson's work was too black and sooty to be natural.

Mr. J. Milne recognised great artistic merit in Emerson's work, but, speaking not particularly of the specimens shown just now, but of Emerson's work in general, he could not see that it was necessary for a "naturalistic" effect to select, for photography, only such phenomenally hideous figures as were generally to be seen in Emerson's photography. At least half of them would be arrested on suspicion only on account of their faces if they were seen by daylight. He proposed a vote of thanks to Dr. Emerson, which was seconded by Mr. A. J. Hare, and carried unanimously.

Mr. I. Isawa showed some excellent micro-photographs, and gave a short description of the means of producing them.

Mr. Kajima Sebi photographed the meeting by flash-light.

During the evening, prints made from negatives exposed on the occasion of the flash-light at Kaga Yashiki, by Messrs. Kajima, West, and Burton, were exhibited.

Production of Silver in the United States.—From a report recently issued by the the director of the United States mint, we learn that the silver output of the United States mines in 1890 approximated 54,500,000 fine ounces, corresponding, at the average price of silver during the year, to 57,225,000 dollars, and, at the coining value of silver, to 70,464,645 dollars, against a production of 50,000,000 fine ounces, of the commercial value of 46,750,000 dollars, and coining value of 64,464,464 dollars in the preceding year, an increase of 4,500,000 fine ounces in the silver production of the United States last year. The silver production of American smelting furnaces and refineries in 1890 was 64,920,927 fine ounces. The total amount of silver offered for sale to the Goverment during the year was 68,130,457 fine ounces, and the amount purchased 37,594,373·75 fine ounces, costing 39,991,840 dollars, 80 cents, the average price per fine ounce being 1 dollar 6 cents. The coinage executed in 1890 by the American Mint aggregated 124,025,365 pieces, of the value of 61,054,882 dollars, 84 cents. There was a marked improvement during the past year in the price of silver, reaching the highest point in 12 years. The fluctuations covered a range of 26 per cent., a wider range by far than in any previous year. At the commencement of 1890, silver was quoted at 96 cents per fine ounce. It reached 1 dollar, 21 cents on August 19th, and closed on December 31st at 1 dollar, 4½ cents. The average price during the year was—in London, 1 dollar, 4·6 cents; in New York, 1 dollar, 5 cents. At the lowest price reached during 1890, the value of the silver contained in the silver dollar was 74·8 cents; at the highest price, 92·6 cents; at the average price 80·9 cents.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

T. Norris.—*Combustible Acetic Acid.* The ingredient referred to under this name in Sir David Brewster's letter of September 10th, 1850, is that now known as *glacial* acetic acid. It is "combustible" from the fact that when heated in a test-tube, the vapour takes fire and burns continuously, which is not the case with the dilute forms of acetate acid. "Azotic acid" is an old name for nitric acid, and would be suitable for coagulating the blood albumen. M. Nièpce de St. Victor probably specified *l'acide azotique*, and so, by a too literal translation, the eminent writer was probably led to adopt the antiquated form of nomenclature.

Old Amateur.—*Bleached Silver Prints.* The mysterious photographs were, as you say, plain silver prints bleached by immersion in a solution of corrosive sublimate, and subsequently washed to remove the excess of mercury salt. Then on treatment with hyposulphite (contained in the blotting paper), the latent image was reproduced. No particular strengths of solutions are imperative, for we have never known the experiment to fail; but the prints must not be gold-toned.

W. T. S. P.—*Photographs of Machinery, &c.* Your programme is rather ambitious, and covers a wide range of requirements. The whole-plate camera and rapid rectilinear or symmetrical lens would be suitable for machinery, but could not be very conveniently taken on your projected pedestrian tour. For the latter purpose one of the kodaks, say "No. 4 folding," with stripping films, ought to answer, and then you might afterwards enlarge your negatives, even up to whole-plate size, if the definition warrants such amplification. The "hire system" is unknown with the better class of cameras.

L. F. (Burton).—*Kallitype Instructions.* The paper is always sent out with full details for working, which we have not space to reproduce in this column. Apply to Messrs. J. Lewis & Co., 100, Gladstone Road, Sparkbrook, Birmingham.

A. M. M.—*Details of Cost.* In the case mentioned we should estimate the wages at £300, and the cost of materials at about the same amount; then rent and taxes, with office charges, at another £100, or probably a little more if advertising is necessary. Much out-door work would add to the expenses, for some of it must be done in the height of the season.

T. S. D.—*Mr. Warnerke's Simplified Process.* The flexible basis described in the official report as "Kent's Patent Vegetable Parchment" should have been *Gaine's* patent parchment, as obtained by immersing thick white blotting-paper in a cooled mixture of two parts by measure of oil of vitriol with one of water.

Exhibitor.—*The Crystal Palace Display.* The course which we indicated a fortnight ago has been acted upon, and we hope it will meet your case.

F. Warren.—*The New Ixol Developer.* The account given in the *Bulletin Belge* by M. René Lacoste-Delpérier, of Le Mans, describes ixol as a new chemical body, the crystals of which are soluble in water. We are not yet acquainted with any such substance. On referring to Watts' "Dictionary of Chemistry," vol. iii., p. 436, we find "ixolite" as the name applied to a fossil resin found in a bed of bituminous coal at Oberhart, near Glogynitz; but this is not likely to be soluble in water, or useful for developing. The word ixol is not mentioned; so, for the present, we cannot help you.

J. Imray.—*The Camera Club Conference* will be held on the 7th and 8th April at the Society of Arts, commencing each day at 2 p.m.

W. H. M. (Hull).—*Persistence of Vision.* The holidays intervening, and the Patent Office closed, we have been prevented from making the search as to the novelty of your suggestion.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1701.—*April* 10, 1891.


CONTENTS.



## AFTER THE STORM.

The letter of Dr. Emerson's which we published last week under the title, "The Storm in the Naturalistic Crater," once more reminds us of the somewhat bitter controversy—now, we are thankful to say, at an end—which for so long a time agitated the minds of many of our leading workers. In looking back upon the history of this discussion, which we have not the slightest desire to renew, we may, perhaps, usefully consider one view of the subject which appears to us to have been lost sight of by both sides. We may fairly assume, to begin with, that the term "naturalistic photography" would never have been invented if a certain school of artists had not first arisen—we refer to painters, not photographers—who worked by methods different to those to which people had become accustomed, and which set at nought, in nearly every respect, the methods adopted in our schools of art. These "impressionists," as they called themselves, broke loose from the established order of things, and painted pictures, in some cases of considerable merit, but which, in others, seemed to represent nature in a way so distorted that the ordinary man could not understand them.

This wandering from the beaten track, instead of being a matter for surprise, should be regarded by the most careless student of human nature as a thing to be expected. Indeed, we have no hesitation in saying that, had it not been for this tendency to stray away which is inherent in human nature, all progress in the world would long ago have ceased. In children this feeling is largely developed, and we suppose that everyone must have felt, at some time in his early years, a yearning to be up and doing, and to break away from the restrictions which encompassed him. If a child find his playground in the meadows surrounding his home, the longing will take the form of a desire to go beyond the boundary line. He will first begin to wonder what lies beyond the visible horizon. "What is there," he will ask himself, "on the other side of the hills?" He will imagine that a more beautiful country awaits him there, and the longing to roam and to find it out will often be strong upon him. When early manhood comes the feeling is not relaxed, but is rather strengthened, only his ideas have expanded, and he begins to dream of fairer lands beyond the sea. If circumstances compel him to stay at home, the longing to break away from established custom will still be strong upon him, and may take the form of change of religion, or some other fancy which his elders will look upon regretfully, and regard as a foolish craze.

It is not strange that artists and students generally, who have the imaginative faculty in a highly developed degree, should, more than any others of their kind, possess this strong tendency to seek fresh fields and pastures new; and the history of all arts tells us that more than once new schools have thus arisen, and have often been productive of good. As a case in point, we may refer to the new German school of music, which, born of the marvellous genius of Wagner, has obtained such a firm footing, although we must admit that certain of his imitators have gone into excesses which bring their works too near to the boundary line which separates harmony from mere noise. A glance at the list of the three hundred or more different "persuasions" or forms of religion which exist in our own country alone, will show that this longing for something different, something better than the world has yet offered, is common even in the more serious phases of human thought.

But returning to art, we find something akin to the present "impressionist" movement in the outbreak of what was called *pre-Raphaelitism* more than forty years ago, and which was thus summarised by a writer of the period:—

"Some three or four artistical aspirants have, within the last four years, exhibited certain pictures distinguished by a peculiar quaintness of conception—a cold, dry, hard, meagre manner, an equalised distinctness of parts, and a laborious and superabundant detail of particulars mistakenly regarded as high finish. In these doings we find great attention paid to little things, and little consideration bestowed on great ones, and, supposing a purpose, the object of the artists seems to be to paint nature as she appears to untutored eyes—

single, separate, unconnected, ungrouped, agreeable with the practice of the earliest, the rudest, and the most unformed aspirants in art; a practice exploded centuries ago, entirely distinct from that adopted by the artists of England or the intelligent of any other country."

The pre-Raphaelite movement would most probably never have claimed the attention which it did had not Ruskin given it his powerful advocacy. He recognised that these young men were really in earnest in what they did, and, possibly, he saw that the new school would, in some measure, infuse new blood and fresh life into the art of the day. Very likely it did so; but who now thinks of painting a picture according to the doctrines then accepted by so many? "The superabundant detail of particulars, mistakenly regarded as high finish," has given place in the impressionist school to an absence of detail altogether, and a blurring of objects which is too often a screen for faulty drawing. Attention to detail was left to the photographer, and the gradual perfection of apparatus has enabled him to do so in a manner which leaves pre-Raphaelitism far behind.

It is, therefore, no matter for wonder that in these days, when photography and art are studied side by side, the new thoughts which have arisen with regard to the one should be applied to the other. Were naturalistic photography to be blindly accepted by all, most surely the reaction would presently come, and a new school would arise which would insist upon microscopic sharpness of definition. So long as human nature is as it is, these fluctuations of thought and taste are bound to occur. It is as much a want of right feeling to treat them with open contempt as it would be to ridicule a man's religion. If there be honesty of purpose allied to any movement, it can hardly be mischievous in its operation, and it is more likely than not to leave behind it influences for good.

Photographic Society of Great Britain.—On April 14th, at 8 p.m., Mr. W. Willis will read a paper on "Platinotype"—a specimen of M. Lippmann's colour photographs will be shown; April 28th, discussion on "Animal Photography"; May 12th, M. Leon Vidal will read a paper on "Photographic Methods of Obtaining Polychromatic Impressions"; May 26th, discussion on "The Influence of Development on Gradation."

To Transfer Photographs.—To transfer a print to wood, metal, glass, or even porcelain, it suffices to well clean the object if it is already polished, and to polish it in the contrary case, and then to spread over the surface a light coating of copal varnish. Then apply the toned and fixed print, still wet, and with a squeegee or printer's roller drive away the air-bubbles and excess of varnish; allow to dry for three or four hours. Then, rubbing gently with a slightly wet sponge, gradually remove the paper, the albumen film containing the image remaining attached to the glass by the varnish. A second coating of varnish will consolidate the whole. The only defect in this process is that it reverses the images. Those who operate on pellicle, or who practise phototype, and detach the gelatine pellicles, can make a reversed print, which, in this case, the process will correct. In this way it is possible to make very beautiful slides for the lantern, which are then to be painted for this particular application. Engravings may also be transferred in the same manner.—*Les Annales Photographiques.*

## THE PORTRAITURE OF THE UNSEEN.

BY JAMES MEW.

"Photography is fertile in useful applications."

This remark has been made so often before that it would seem at first unnecessary to make it again; but, as sermon after sermon is preached on the single subject of Christian obligations Sunday after Sunday, and will probably continue to be preached for some time to come, so the sentence at the commencement of this paper is likely to be again and again repeated, and has as much reason as the sermon for its persistence. Photography, like the sea-god Proteus, is capable of appearing to us in very different forms, and of giving us help in all. It provides for us deftly what we earnestly desire, and could apparently be by no other means provided, as the magic lamp gained for Aladdin, the poor tailor's son, an alliance with his beloved princess, the beautiful Badrulbadur. If we seek its assistance in the domain of the infinitely great, it will register for us volcanic explosions of the sun; if in the infinitely small, it will present us with the three-horned *Triceratium*, or the dissection of the dust on a butterfly's wing.

Some confusion formerly arose between small representations and the representations of small things; in other words, between micro-photography and photo-micrography. The difference between them has been well expressed by Ogilvie, who explains photo-micrography as an art or process of enlarging minute objects by means of the microscope, and projecting the enlarged image on a sensitised collodion film. Micro-photography, on the other hand, is an art or process by which an object is diminished in size, and yet its exact form retained. This latter art or process was of considerable service during the Franco-German war, in conveying intelligence to and from Paris while in a state of siege. But a decade of years before that time micro-photographs were a fruitful source, if not of advantage, at least of amusement.

Among the many delights which please children both of smaller and larger growth at the Crystal Palace, is to be found a delight, born of micro-photography, in the ivory works, wisely thus placarded, "Admission Free." The humble shilling admission fee is now so often quadrupled and quintupled if the visitors desire to see any of the sights advertised to be seen, in our various places of public entertainment, that this notice is as welcome as it is necessary. In these ivory works may be purchased a pen-holder, perforated at the end farthest from the pen. By looking through this little hole, may be seen the Crystal Palace, or Queen Victoria herself in all her glory. This attractive peepshow seems to have originated in the Paris Exhibition of 1859. There a little spy-glass stood in the place of the pen-holder. This *lunette breloque* containing a spot of paper not larger than a pin's head, a lilliputian photograph, showed through a magnifying piece of crown glass to the astonished eye the portraits of the 450 deputies of the French Empire.

During the Siege of Paris in 1870-1, microscopic photography succeeded in reproducing on a pellicle of collodion, weighing only a few centigrammes, and in size of two or three square centimetres at most, as many as three thousand despatches—in other words, as much as sixteen folio pages in three columns of printed matter. Private or public despatches, containing some 300,000 letters, were reduced to the size of a quarter of an ordinary playing card, and trransferred from paper to collodion films. These microscopic notices were rolled up and placed in a quill about the size of a tooth-pick, constituting a novel kind of letter-box which was fastened to the tail of a pigeon, and this winged postman of the air, undelayed by any amorous solicitation of or cook housemaid, carried them safely to their destination. Each pigeon was able to carry as much matter thus reduced to a minimum of space as might be contained in ten small octavo books of some three hundred pages each. The pellicles, on arriving at their destination, were unrolled by means of ammonia, placed between two glasses, and projected on a screen by the aid of a photo-electric machine or powerful magic lantern. Copyists then transferred the characters on the screen to paper. These pigeon postmen suffered much from inclement atmosphere and aerial pirates known as sparrow hawks; nor, as far as we know, did it occur to the Parisians to imitate the example of the inhabitants of Pekin, who are said to affix whistles of bamboo to their pigeons' tails, which thus make such a noise during their flight through the air as to fill their enemies with alarm.

But it is not with micro-photography, but with photo-micrography, that this article is more nearly concerned. The wonders of the unseen world have attracted interested observation ever since the invention of that well-known optical instrument of enlargement which Dr. Goring, in defiance of the reverence due to age, and in spite of firmly settled precedent, persisted in calling an *engiscope.* This interest has been greatly increased, and the means of observation greatly facilitated, by the happy marriage of the microscope with the camera.

Photo-micrographs—or photographs of microscopic objects—were taken at least forty years ago. In a paper on "The Application of Photography to the Representation of Minute Objects," by Joseph Delves, published in the *Transactions of the Microscopical Society of London* for 1853, positive photographs are shown taken from collodion negatives (1) of the spiracle and trachea of the silkworm magnified sixty diameters, exhibiting the elastic spiral fibre between the layers of the air vessels; and (2) of the proboscis of the common fly magnified one hundred and eighty diameters, showing the divided absorbent tubes. Dr. Woodward, a well-known authority, in a contribution to the *American Journal of Science and Arts* in 1866, expressed his opinion that "henceforward photography is indispensable to the proper representation of microscopic objects, and is adequate to the satisfactory representation of all microscopic objects that do not depend for their value on colours."

Photo-micrography, dealing with pictures enlarged by the microscope, has, by its union with that instrument, become one of the most powerful auxiliaries of investigation in the science of nature. Chemistry, biology, petrology, botany, have alike profited by its welcome support. It lifts the curtain from the infinitely little, and reveals the secrets of the tiniest and most delicate structures in the animal and vegetable world. Insects and infusoria, grains of pollen and potato starch, particles of yeast and tissues of plants—all the wonders of invisible existence unseen by the naked eye, and studied only with fatigue through the microscope, are fixed in the photographic film with a precision unknown to the most scrupulously and minutely exact of Dutch designers. Photographic fleas, male and female—the latter the larger, the stouter, and the more dangerous—old, decrepit fleas, larval infant fleas in youth's first blossom, looking like legless caterpillars; fleas in health and in sickness; fleas of all sorts and conditions, though not good sitters, become, after their frolic activity has been for ever stilled by death's icy fingers, the most favourite subjects of photo-micrographic portraiture. Representations, mathematically exact, of those marvellous organisms, found in numbers not to be calculated by any Walsingham or Cocker, on the surface of weeds on the seashore, and on flints washed by mineral waters; those confervoid algæ, called *Diatomaceæ* by the learned, with their fronds linear or circular, flabelliform or geniculate; perfect plants, and yet ever so much smaller than the smallest prick of the finest needle, are shown by photo-micrography as nature made them. A carte-de-visite of a *coscinodiscus,* that sieve-quoit of the ocean, and fossil deposit of the much-vexed Bermudas, may now be handed round for the inspection of the fashionable guests at a four o'clock tea. That most difficult test-atom, the *Amphipleura pellucida*, by which, we are told, the American, Dr. Woodward, has attained world-wide celebrity—his work in that direction never, perhaps, having been equalled by anyone, and certainly never excelled—is likely soon to become to us as familiar as the face of a household friend.

*(To be continued.)*

## Reviews.

An Easy Walk Through the British Museum, or, How to See it in a Few Hours. By Louis Fagan. (*London: Luzac & Co., 46, Gt. Russell Street, Bloomsbury.*)

This is a book which was sadly needed by the holiday folk who visit our great national collection, for it consists of a short and clear description of the more notable objects contained therein. Commencing with the Roman gallery, it calls attention to the principal busts, such as those of Marcus Aurelius, Hadrian, and our own Julius Cæsar, and gives a short account of their lives and doings. It then takes the reader through the Græco-Roman galleries, and points out why so much interest attaches to the numerous sculptured fragments which are to be seen there. The Egyptian antiquities next come under review, followed by those of Assyria and Babylon. In this manner an interesting tour is made through the building, ending with a description of the wonderful reading room, whose dome is only inferior to that of the Pantheon at Rome by two feet. The book is illustrated liberally with Dallastint blocks, and these are so well executed that the reader at once recognises the particular object described.

Photography in a Nutshell.

This is a second edition of the excellent little hand-book published by Mr. Tylar, of Birmingham. This edition is interleaved with blank pages, so that the owner may make notes of formulæ, &c., as he studies the volume. The book would, however, be much improved by the addition of a title page and table of contents.

Cardiff Photographic Society.—An International Photographic Exhibition, including photographic apparatus and appliances, will be held in the Public Hall, Queen Street, Cardiff, from 12th to 26th August, during the visit of the British Association. The list of classes and awards includes four divisions, viz., open to amateurs and professionals; open to amateurs only; competition between photographic societies; and open to members only. A form, to be filled up and returned not later than 30th June next, may be obtained from the hon. secretaries, G. H. Bedford and T. H. Faulks, 127, Bute Road, Cardiff. All exhibits must be delivered at the Public Hall, Queen Street, Cardiff, on or before Friday, the 7th August.

## THE CAMERA CLUB CONFERENCE.

This Conference opened on Tuesday last at the rooms of the Society of Arts, John Street, Adelphi; there was a fair attendance. and doubtless the numbers would have been greater had they not all known that they would soon have the opportunity of reading the papers for themselves in print. As is customary at this annual meeting, Capt. Abney, the President of the Camera Club, took the chair, and opened the proceedings with the usual presidential address. Capt. Abney began by pointing out how the Camera Club was now a great power for doing good in the photographic world, both by its weekly meetings at the Club House and by this annual Conference in which they had all met to take part. He also pointed out that although the presidential address is usually considered outside discussion, he invited those present to make remarks upon certain of the matters to which he intended to allude.

The first subject which came under review was the suggested standard system of weights and measures, and the questions as to whether such a standard should exist, and what that standard should be, were, he said, most important ones. For his part, he must speak somewhat under reserve, because of the approaching Congress of Photographers at Paris, where he was appointed to act as a delegate from the Photographic Society of Great Britain, in which capacity he would have to deal with this very question. He was certainly of the opinion that a standard should be universally adopted, for the present arrangements led to very great difficulties. Our plate manufacturers, for instance, found that the plates which they made would not fit the apparatus made abroad, and *vice versâ*. With regard to the question as to what standard should be adopted, this had already been discussed before the Photographic Society of Great Britain, and the general opinion seemed to be in favour of taking the 6½ by 4¾ as a basis upon which the standard could be fixed, a size that would correspond very closely with the French size 26 by 18 centimetres. The other sizes would be calculated from multiples of those numbers. The whole-plate would then become 9 by 6½, and would be in this form of far more artistic proportions, in his opinion, than the existing 8½ by 6½. The 12 by 9 would take the place of the existing 12 by 10 or 13 by 9, and the gain in both cases, in artistic effect, would be great. Indeed, he believed that the sizes based upon the method indicated would all be better than the old ones which had been in use in this country for so long. Among the other advantages gained would be the retention of the English inch, which is better than the centimetre. By this means he hoped that a compromise satisfactory to both the Englishman and foreigner would be arrived at.

With regard to the question of weight and volume, he asked, Is a compromise possible here? We, of course, might use the decimal system; and that method was certainly attractive when applied to small incomes, for 2,500 francs certainly looked much more important than £100. But in spite of much that had been said and written upon this question of the adoption of the decimal system, no real impression had yet been made upon existing methods; although chemists used the system almost universally, it is not likely to be used by photographers generally, only a few of whom are chemists. The gramme he looked upon as inconvenient, for it was too large in some cases, and too small in others; and the grain, as generally used by us, is far better. In writing formulæ, he would recommend the adoption of the expression "parts"; thus, a one per cent. solution of pyro would mean one grain in one hundred grains of water; the grain would then become a unit of weight, and the decem a unit of volume. The existing ounce measure would be displaced in favour of the decem.

Captain Abney next alluded to the researches of Messrs. Hurter and Driffield, and he gave these gentlemen every credit for their valuable work. Although there were details on which he differed with them, he might say that recently they had met, and he believed a satisfactory result had been arrived at, which would shortly be published. He had always looked upon this question of measurement of density as a most important one, and he considered that he was justified in publishing his views in full in the *Photographic Journal*, although some had questioned the propriety of doing so.

Photography in natural colours was the next question to which the President turned his hearers' attention. The 'accomplished fact," as some of the newspapers led their readers to suppose, is as old as photography, for the discovery of photography in colours has been made, according to some people, over and over again. Being in Paris a week ago, he had the opportunity of visiting M. Lippmann. He found that gentleman to be a true man of science, with all the modesty of a real investigator. The colour plates about which we have heard so much are due to interference, and not to pigments, and their effect varies according to the angle at which the plate on which they appear is held. Capt. Abney then proceeded to describe how these colours are obtained, by use of a mercury trough, as already detailed in our pages. He pointed out that, to obtain the colours, exposure to a bright spectrum was necessary, and that development must be brought about by alkaline carbonates, and the image intensified with silver. Both exposure and development must be exactly correct, or no colours are apparent, and the best results are gained with dry plates prepared with albumen and collodion. He looks upon the results of M. Lippmann's experiments merely as a verification of Newton's law, and not as a discovery of photography in colour. M. Lippmann has certainly succeeded in fixing interference colours, but the process is clearly one of extreme difficulty. It is a misfortune both for M. Lippmann and his predecessor Dr. Koch, that their experiments should have been dealt with by the ordinary reporters, because these reports have led the general public to expect far more than the experiments in either case justified.

A somewhat desultory discussion followed the reading of Capt. Abney's address, and Messrs. Debenham, Warnerke, and others took part in it.

Mr. Warnerke, who is also a member of the Photographic Commission which is presently to meet at Paris, considered that the half-plate, being a very general size in use, was a convenient basis upon which to found the proposed standard sizes. To introduce plates which could not be used in English cameras would be unreasonable. He considered that Capt. Abney's suggestion to use parts instead of drams and ounces to be a good one, and that if any standards are used, they should be adopted universally. He was in favour of the standard metre being adopted as a measure of length, for every-one understood it. He then made a few remarks with regard to lens diaphragms, and alluded to the system advocated by Mr. Dallmeyer.

The latter gentleman was present, and gave his reasons for adopting the system associated with his name.

Capt. Abney, in closing the discussion, remarked in passing that he had lately ascertained that the original lens used by Niepce was fitted with what is now known as an "Iris diaphragm," and he suggested, therefore, that the name of that form of stop should be changed to the Niepce diaphragm.

The next paper on the list was that by Mr. Lyonel Clark, on the "Use of Uncorrected Lenses." Mr. Clark, in the opening of this paper, alluded to the demands which æsthetic photography had made upon workers with the camera, and pointed out how in the old days photographers used to revel in the amount of detail which they found possible by the use of the instrument; and how afterwards this question of extreme sharpness was condemned. He owned, for his part, that he preferred sharpness to fuzziness, but at the same time he advocated a certain amount of softness. One method by which this result might be obtained was by the use of a pinhole, but this method not only required very long exposures, but it put figure subjects quite out of court. Another method of obtaining the same result was by putting the lens intentionally out of focus. He detailed a number of interesting experiments which he had made with ordinary spectacle lenses, using them both as single lenses, and as doublets of various focal length, and with diaphragms of varying sizes placed in different positions, and with the two lenses separated to a greater or lesser degree. He showed, by means of negatives which were handed round to the audience, what results could be obtained from this simple form of lens, and he owned that he was himself surprised to find how good these results were. He next explained the method by which his tests were made, and showed how he used a large camera with a lens mount in front which could be moved on a vertical axis. The trial lenses he mounted in rings of cork, and then fitted them within the mount, and used an iris diaphragm. He showed a most ingenious method of recording the results given by different lenses on the same plate. This was brought about by placing a sliding shutter arrangement in front of the focussing screen, so that different horizontal strips of the plate could be submitted to the action of the lenses one by one. As a summary of his results, he said that spectacle lenses were no more likely to replace ordinary photographic lenses than were pin-holes. They gave very respectable results for landscape work if well stopped down. On the whole, he considered that opticians need not put up their shutters in consequence of any revelations which his experiment may have made.

Mr. W. E. Debenham said that although, for occasional purposes, it might be desirable to lose sharp definition, yet, generally speaking, he thought a photograph should be as well defined as possible. The objection to definition had, he thought, very much arisen from the different meaning of the word sharpness as employed by artists and by photographers. Photographers, by sharpness, understood fine detail, whereas when painters spoke of being too sharp, they referred to harsh or cutting lines. He had known painters condemn harsh, under-exposed photographs as being too sharp when, photographically, they were not sharp at all. On the other hand, a photograph might be sharp in the photographic sense of being exquisitely defined, and soft at the same time. With regard to Mr. Lyonel Clark's statement that lenses made of one kind of glass only could be achromatic or have the chemical and visual foci, he would like to have some proof offered. As to the Zentmayer lens, he had, at the time that a claim for coincidence of focus was made, shown that apparent coincidence was managed by directing the operator to focus with a large diaphragm, and then insert one of a calculated smaller size for the exposure. For lenses having spherical aberration, the alteration of diaphragm practically alters the length of focus, and, by regulating the sizes of the diaphragms, this could be done to just the extent required. He had published this explanation at the time in the *British Journal of Photography*, and shown the editor a lens of his own construction in which these conditions were fulfilled. It had been claimed for uncorrected lenses—not in this paper, but by Mr. J. H. Dallmeyer and Mr. T. R. Dallmeyer—that, by introducing spherical aberration, and sacrificing definition at the focal plane, the focus of other planes was improved. The true view he held to be that expressed by Petzval, Burton, and others, and was that when definition was sacrificed at the focus, the other planes, not having a sharp one to contrast with, did not obtrude their want of sharpness so much. In the report of the last Camera Club Conference held here, is a paper by Mr. T. R. Dallmeyer, illustrated by photographs, professing to show the advantage of spherical aberration in giving definition on out-of-focus planes. This was supposed to be proved by photographs taken at a so-called "best focus," and at certain distances therefrom. On examining the photographs, however (which were here handed to the president), it will be seen that plate xvi., which is stated to be taken half an inch from the best focus, is actually in better focus than plate xv., which is said to be in the best focus. A similar thing, though not to the same extent, is noticeable in plates viii. and ix., where the one said to be removed from the best focus is in a little better focus than that in the so-called best focus. In a more recent endeavour to meet this objection, Mr. Dallmeyer says that the visual effect on the screen is not the same as in the fully-developed negative. If this were so, and it had any bearing on the subject, it would just go to show that, independent of other drawbacks, the introduction of spherical aberration would necessitate shifting the position of the plate after focussing, as with lenses not properly achromatised. If the difference in sharpness, say in plate xv. (the so-called best focus) and xvi. (the one said to be half an inch removed from the best focus), had been less glaring; if the real best focus had been somewhere half-way, so that the one stated to be in best focus were not manifestly in the worst, the fact that the demonstration had not been performed in the manner stated respecting it might have escaped detection. As it is, the professed proof is too much overdone, and a cause which requires to be supported in such a way stands sufficiently condemned.

After a few words from Mr. Dallmeyer and from Mr. Traill Taylor, Capt. Abney closed the discussion. He owned that he preferred sharpness in a photograph to fuzziness; that he had himself tried spectacle lenses in a great many different ways, and he believed that many of the cheap cameras are furnished with two simple lenses of this character, with a diaphragm between. One which he had lately examined certainly had that construction, and with such an arrangement a very decent image was producible. A combination of this kind was perhaps useful in teaching beginners their first steps, and in leading them to wish for better results by the use of more perfect optical arrangements.

Next in order was Mr. Pennell's promised paper, entitled, "Photography as a Hindrance and a Help to Art." The author being, unfortunately, absent, the reading of this paper was entrusted to Major Nott. Mr. Pennell begins his paper by asserting his belief that it was the custom at these conferences for members of the Camera Club to lure some unsuspecting artist to the meeting, to get him to state his opinions upon his art in relation to photography, and then to fall upon him and pulverise him. But he was prepared to make a very good fight for himself. Photography he considered to be a thing which is not a fine art, and which never can be. It employs an unintelligent machine to obtain results which really depend for their artistic value upon human intelligence and highly developed technical ability. The nearer a machine-made photograph seeks to approach artistically produced art, the more glaring are its defects, and the more are its shortcomings. Comparing a photograph with an etching, both representing the same scene, or the same figure, the etching may be a great work of art, while the photograph causes amusement for a moment, and may then become food for the paper-mill. If six artists were to render the same object, each of their renderings would be entirely different; but if six cameras were used, the results would be so similar that there would be no choice between them. Photography has not helped to make artists more accurate; all that photography has done is to prove things which were well known before. No object other than a perfectly flat one, which can be placed directly in the front of the middle of a lens, is rendered by the camera with entire truth. Truth of light, shade, colour, and tone no photograph has ever recorded, or will record, although it is claimed for photography that it renders detail in such a wonderful way. He did not find anything in it as faithful to detail as the drawings of Albert Durer and others. Mr. Pennell next points out how photography hinders artists, and as a proof of what he advanced, he stated that some years ago he obtained a number of photographs in order to help him in making some drawings of certain cathedrals. He carried the photographs down to one of the cathedrals, and after comparing them with the building he tore them all up. He maintained that these photographs were altogether worthless, both because the proportions were wrong, and the distance was absurdly reduced by what he would call "photographic perspective." He maintained that although the photographic view may be correct, artistically it is absurd, and it removes all feeling of size, impressiveness, and dignity. He also said that many of the features, such as distant turrets, and even towers, were completely ignored in the photograph, although visible to the eye. Passing on to instantaneous photographs, he said that it was frequently asserted that these were of great value to artists. He admitted that they were useful as suggestions and hints in the case of swift motion, and saved a great deal of trouble; but the man who depends upon them will become a photographer, or he will be of no value as an artist. Results remarkably near being artistic have certainly been obtained by a few workers with cameras, either because they used artistic methods, or by successful flukes. He then asked the question: "Of what use is photography to artists, and why did they practise it?" They took it up because it was an interesting and fascinating study, apart from their work, and because the photograph furnished them with details which often they have no time to draw. He then recorded his own experience with a detective camera in France. On one occasion he endeavoured to take some photographs of a number of people dancing. He sent his exposures to London to be developed, for he admitted that he was unphotographic enough to merely "pull the string." As a result, he had six good pictures and thirty-two failures, and he had to wait nearly two months before these results were obtainable. He would have done very much better if he had dispensed with the camera, and kept his eyes wide open, and his pencil at work. Photography is certainly beneficial to the illustrator, and more or less to the painter in other ways; especially is it useful in photographing drawings on to wood or other material, or reproduction, and it was grievous to think how, before this method was adopted, our works of art utterly disappeared under the hands of the engravers—referring here, of course, to the destruction of the original drawing on the wood block by the action of the graving tool. After a few remarks on wood engraving *versus* process blocks, he said that many artists feared that the improvement of these processes, especially that of reproducing wash drawings, will injure wood engraving. He is of opinion that it cannot injure the best wood engraving, and in art certainly it must be a case of the survival of the fittest.

As may be imagined, this paper, which was so plain-spoken in its contempt for photography, gave rise to a somewhat animated discussion.

Mr. Maskell answered the paper point by point, and his remarks were frequently applauded.

Mr. Robinson thought it should be taken as a huge joke, and that its reading should have been received in solemn silence.

Mr. Davidson pointed out that the principal statements were unsupported assertions, and showed the entire ignorance and innocence of the author of photography. He combated the extraordinary statement that detail is better rendered by draughtsmen than by the camera, and, as a proof of his contention, he called attention to Mr. Stevens's beautiful lantern slides of flower subjects, which contained detail which would be quite impossible for any draughtsman to reproduce; but he believed that we ought not to take Mr. Pennell's remarks too seriously, as possibly he only meant to amuse the meeting. It was a pity, if his remarks are to be taken seriously, that he did not support his contentions with some kind of proofs. His paper showed ignorance of photographic resources, and he had probably gained his experience only from the use of short focus lenses. Were he to study the works of our leading photographers, the pictures of Robinson, Emerson, and others, he felt certain his notions would be modified.

Major Nott followed by saying that it was evident Mr. Pennell did not know good photographs from bad ones; that artists in France now acknowledged that photography had made fresh demands upon them, and realistic scenes are now produced by them, which before the time of photography were undreamt of. Major Nott concluded his remarks by referring to Muybridge's photographs of animals in motion.

Mr. Valentine Blanchard pointed out that Mr. Pennell had probably written in haste; that, in spite of himself, he has been, and always must be to a certain extent, under the influence of photography. As a proof of what he meant, he referred to an old book on cathedrals (Winkle's), published before photography got to be a power, and he invited Mr. Pennell to compare pictures in this old book with his own work of to-day. The first was false in every way, and some of the pictures were, indeed, truly offensive to the eye; in fact, he maintains that photography has, in a measure, taught the eye to see.

Capt. Abney, alluding to Mr. Robinson's opinion that the paper should have been received in silence, said that, on the contrary, photographers should be glad of any criticism. Mr. Pennell had evidently not been quite so successful in photography as he had been in drawing. With regard to his remarks upon photographic perspective, he himself only recognised one kind of perspective, and that shown in a good photograph is quite as good as any in an artist's picture, and often much better. Mr. Muybridge's photographs of animals in motion had done much to add to our knowledge, but he, for his own part, felt glad that artists had had the good sense not to make use of the somewhat grotesque attitude shown in their works.

The last paper on the list was entitled, "A Note on the Physiological Aspect of some Problems in Art," and as the meeting had been somewhat prolonged, this was taken as read. The meeting closed with the usual votes of thanks to the readers of the papers.

---

The Camera Club Conference was re-opened on Wednesday by the reading of Major Nott's promised paper on "Photography as Applied to Illustrated Journalism." The writer pointed out that the recording of current events by pictorial means was one of the most noticeable features of the past decade, and it was evident to all, from the profuse way in which literature was now illustrated, and the way in which journals—not necessarily illustrated journals—were inserting pictures constantly in their pages, that there was a demand for this kind of work on the part of the public. Pictures, too, were now used to a greater extent than ever they were for advertising purposes. In these matters, the public taste has had to be educated from very early examples up to the present. But time would not admit of showing how this has taken place. He might refer to the Egyptian Hieroglyphics, to the Bayeux tapestry of far later date, and other pictorial records which appeared long before the development of the printing press. Up to quite recent times this mode of illustrating for press purposes has been in the hands of a few artists who worked with the pencil, but such pictures were only valuable in an artistic sense. For his part, he believes that accuracy of detail is the thing to be preferred. Artists will often sacrifice this accuracy to their ideas of what is artistic, and they have often been led by this feeling into absurdities—witness, for instance, the libels on animals, which have been so common, from the pencils of artists.

Major Nott next went on to point out the technical methods necessary in obtaining illustrations for a public journal by means of photography. With regard to the camera to be used, he had no hesitation in saying that the hand-camera was the essential form of instrument. Some of these cameras, however, were quite unsuitable for the work. The prime essentials were lightness of weight, and a ready means of using the shutter and removing the exposed plates, any delicate mechanism likely to get out of order being quite out of place. Another point in using these hand-cameras was, that the manipulation must not be such as to claim any great attention on the part of the operator. His whole attention must be concentrated upon the scene before him, and the rest must, to a great extent, take care of itself. Such a camera should be provided with a shutter which will work either slowly or quickly as required, and the lens should be one of long focus, and such as will work with the largest possible aperture. This last provision is an important one, because, with lenses of small apertures, pictures cannot be taken on dark or foggy days. With the lens which he himself has used he has been able to obtain pictures actually in a November fog—although he does not by this term allude to a "London particular." With such a lens, too, it would not be impossible to obtain pictures, should occasion arise, in well-lighted interiors.

With regard to the diaphragms, he would suggest that only three stops are necessary, and they may for convenience sake be marked "dark," "bright," and "sun"; meaning that the first one is the slowest of the series, and would be suitable for dark situations; the second would be a stop of medium aperture, which could be used for the generality of subjects; and the third one would be used with the quickest exposures for seascapes. It would be much better to label the stops in this manner than that the operator should have to bother his head about "*f*" this or "*f*" that. The plates must be of the best—if plates be used—but, for his part, he looks upon the roll-holder and the celluloid film as perfection for this class of work, and by the use of such a film the great nuisance of resorting to the dark room continually is avoided. Another advantage in using films is that the pictures can be produced at great speed, and this is often a *sine quâ non* in journalistic work. A long strip of pictures can be developed by one operation, and can be taken from the fixing bath while wet, and speedily printed from. It must not be thought that these pictures can be taken by an unskilled hand. The operator must be able to distinguish between what can and what cannot be done; in other words, he must understand the limitations of the instrument. He cannot, like an artist, alter the position of the figures before him at will, but if he only have the virtue of patience, these figures will sooner or later arrange themselves, and give him an opportunity of taking his picture. The camera must be level, and should be furnished with a view-finder of large size, so that the artist can watch the image on the ground glass screen, up to the moment that he touches the trigger. He must, of course, before this last operation is arrived at, take care that his pictures compose well, and do not offend any of the principal canons of art.

The one dominating idea must be that the picture shall tell its own tale, and care must be taken that the culminating or central object in it shall occupy the principal place. For example, let us suppose that there is a Royal ceremony—say the unveiling of a public monument. The first thing to do is for the photographer to fix upon the position where the light will avail him the most, then he may take the picture of the reception by the troops, and, if this is done well, anyone looking at such a picture will in a minute understand the situation, and will almost be able to hear the strains of the National Anthem. Then, with regard to the unveiling of the monument itself, he must choose the exact moment when the string attached to the veil covering the sculpture is released, and at that moment the button of the apparatus must be pressed. Photographs of historical scenes of this kind must have a value far beyond the pictures due to draughtsmen, on account of their undoubted accuracy. How priceless, for example, would be photographs of events which occurred in the reign of good Queen Bess, supposing that such pictures were in existence.

In conclusion, Major Nott explained that his object in calling attention to this subject was, that photographers generally should understand the conditions on which photographs intended for illustrated journalism ought to be produced. The journals now relied greatly on photographs or sketches sent in by outsiders for acceptance. Everyone now uses the Kodak or similar instrument, and if his remarks had tended to assist anyone in his work in this direction he would be amply rewarded. They should remember that haphazard photographs are, as a rule, perfectly valueless, and that care and attention to details are required in the work.

Capt. Abney, in opening the discussion upon this interesting paper, regretted that Major Nott had given no information about the transfer of photographs to wood blocks, and he called upon Mr. Carmichael Thomas, the art director of the *Graphic*, to favor them with a few remarks upon the general subject.

Mr. Thomas said that he had come to the meeting quite unprepared for any speech-making, but he wished to acknowledge to this club of photographers how much the paper which he represented was indebted to photography for many of the pictures which they published. Indeed, in many cases, he said, it was quite unnecessary to send a special artist to scenes of popular interest, as the manager of the *Graphic* was aware that they could rely upon plenty of photographs being sent in to the office by strangers and outsiders.

Mr. Hepworth said that he had been so long connected with the *Graphic* that he knew something about this subject of illustrated journalism, and the various modes adopted for turning pictures into printing blocks; but the ground had been so well covered by Major Nott's remarks, that he merely rose in response to the remark of Captain Abney with reference to the transfer of the photographic image to the engraving block. Some years ago he had made a number of experiments with different modes of doing the work. He had tried the collodion film, collodio-bromide emulsion, the albumen, and various other processes, but he thought, perhaps, that he had worked in a new direction by adapting gelatino-chloride emulsion to this purpose. The method he adopted was to make a chloride emulsion with a very small proportion of gelatine in it, and to rub the paste thus formed on to the surface of the wooden block with the finger; the block so treated was dried, exposed under a negative, and developed by the usual means. The process gave satisfactory results, as far as the speaker was concerned, but on submitting the block to a wood engraver, the latter complained that the surface of the wood block had been, to a certain extent, hardened by the chemical process, and made difficult to cut with the graver. He thereupon altered the emulsion in different ways, with the result that the hardness disappeared, but the engraver now contended that the surface of the wood had been made too spongy and soft. As it seemed impossible to hit a happy medium between these two extremes, Mr. Hepworth had ceased his experiments.

Mr. W. E. Debenham had hoped to hear something of the process blocks which were coming so much into use for illustrated periodical literature of the higher class. In this department there were two directions in which great advances had been made: the one was in the improvement of block processes, and the other in improved machinery by means of which alone blocks could be properly rendered. Until recently it was considered that rotary machines, such as were necessary for rapid newspaper work, could not be made to act with sufficient nicety for process blocks; but the work of the Marinoni rotary machines had dispelled this idea.

Mr. Warnerke advocated, for the treatment of wood blocks, the transfer of an image in greasy ink direct from the gelatine film—that is to say, a collotype transfer; and Capt. Abney, in bringing the discussion to a conclusion, considered that though Mr. Hepworth's experiments were interesting, the last-named method was, on the whole, best to pursue, probably for the reasons that it involved no wetting of the wood-block, and no film to interfere with the graver.

The next paper read was not on the list, but it proved to be one of great interest. The subject was a new method of producing process blocks, by Mr. H. Sutton. This method consisted in obtaining a direct electrotype from a gelatino-bromide plate, the result being a half-tone block, resembling, in all essential features, that produced by the Meisenbach process. Mr. Sutton, unfortunately, was not very well heard in the body of the room, but we understood his process to be as follows, although here we can only give a mere outline of it.

After exposing an ordinary gelatine plate beneath a positive on glass, or an ordinary print on albumen paper together with the negative of a line screen, the plate is developed with alkaline pyro or hydrokinone, and fixed in strong hypo. The plate is then washed, care being taken that the image does not absorb too much water during this necessary operation. Next, the plate is heated on an iron horizontal surface very gradually by a Bunsen burner, and, while this heating is proceeding, a curious change can be observed extending over the surface of the gelatine. The little dots formed by the line screen remain perfectly insoluble, but the gelatine which has been unexposed between those dots melts to a certain extent, and leaves the exposed dots standing up in high relief; in other words, the image engraves itself by means of heat. The plate is next dried, and, after being dusted over with graphite to give it a conducting surface, is at once placed in a copper solution in connection either with a battery or with a dynamo machine, as in the ordinary electrotyping process, and a metal block is the ultimate result. The copper solution causes the gelatine to swell to a very slight extent, but not enough to blur the image which it bears. Two plates were handed round for inspection. together with proofs pulled from them in an ordinary press. These were certainly of very fair quality, considering the simplicity of the process employed, and they raise hopes that, as the method comes to be experimented with—as it most surely will be—that it will be found capable of far finer work.

Capt. Abney said that the Conference must be congratulated on having this process brought before it for the first time. Although he was pretty familiar with most of these processes, this one certainly bore the stamp of novelty. He might say, in passing, that on one occasion, when he had dried a gelatine plate in the sun, he found that it gave exactly the same results in the partial melting of the unexposed parts as explained in Mr. Sutton's paper.

Mr. W. E. Debenham thought the utilisation of the quality of gelatine, of agglomerating under the exposed portions when heated, was very ingenious. The process might be expected, with further experiment, to be of great service from the rapidity and simplicity of the manipulations employed.

Mr. Bolas also spoke, and said that he was under the impression that the suggestion to use a gelatine plate for direct production of electrotypes came originally from Mr. Swan. He knew that Mr. Warnerke had also worked in the same direction, and, possibly, that gentleman might have something to say on the subject.

Mr. Warnerke remarked that unfortunately—possibly owing to the acoustic properties of the room—he had been unable to catch a great deal of what the lecturer had said, and therefore it would not be fair—indeed, not possible—for him to criticise the paper.

Professor Minchin's paper, entitled "A Review of Photo-Electricity," was the next in order. He gave a detailed account of a number of very interesting experiments which he had made with regard to the action of light upon plates of different metals which had been rendered sensitive to light, and with regard to the electric currents which accompanied exposure of such plates. We have not space to explain in detail the nature of these experiments, nor is it necessary that we should do so, as the author read a paper on the same subject a short time ago before the Physical Society. Prof. Minchin explained that he took up this subject in the year 1877, not knowing, at that time, of Becquerel's experiments in the same direction. A greater photographic interest was attached to certain experiments which he described, in which an electric current was passed through a plate prepared with sensitive emulsion. He showed how the plate was immersed in a solution of bromide of potassium, and, together with another plate, was connected with a bichromate battery cell. This was done in the dark; but when light was allowed to fall upon the arrangement, the result was that the plate connected with the carbon pole—which, by the way, was only half immersed in the liquid—was at once blackened, but no effect was apparent on the plate which had been in connection with the zinc pole of the battery. There was, however, a distinct blackening in the immersed portion of this latter plate when it was subjected to development. Very interesting, too, was an experiment in which two clean silver plates were immersed in a solution of phosphorescent eosene; their upper ends being attached by wires to a galvanometer. When such an arrangement is prepared in a darkened room, and allowed to settle down for some hours, an extraordinary result occurs on exposing the cell to light. There is an immediate deflection of the galvanometer needle in one direction, but this is only momentary, and the needle then becomes permanently deflected in the reverse direction. If the light is then shut off suddenly by a screen, the current, curiously enough, is increased, but this movement, too, is only momentary, for the needle slowly goes back to zero. If diffused daylight or direct sunlight are used alternately, every variation is noted by a movement of the galvanometer needle. When a taper is used, the impulsive sudden action is not apparent, and there is a steady deflection showing that the electric action is due to rays of light which are not present in the flame of the taper. The author explained that he had not yet had time to repeat these experiments with other fluorescent liquids, but he expected that they would give him similar results. He compared the electric action to induction, the current in one wire inducing a reversed current in another wire placed near it. In most electric cells, the currents thus afforded are very feeble in character, but he showed how it was possible to make special cells, which give very much stronger effects. Tin and its salts were, he found, the best elements to use, associated with liquids such as alcohol, which offered great resistance. He then showed how, by special treatment, a strip of tin-foil could be sensitised, and he also proceeded to explain, by means of diagrams, that when such a strip was coupled up with a galvanometer, some very wonderful results could be produced. When such a strip had been in use for some hours it became insensitive to light; but, by using an electric machine in the same room with it—but which, at the same time, was at a distance of twenty feet or more from the strip—a spark having been allowed to pass between the terminals of the machine—the distant strip suddenly becomes once more sensitive to light. This is not caused by any light from the spark itself, for the same result is brought about if the electric machine be shut up in a dark box. He has gained this astonishing result when the plate has been from eighty to ninety feet distant from the electric machine employed. He has also found that the sensitiveness can be restored to an exhausted plate of this character by simple mechanical means. Thus, a tap with any hard substance on such a plate will, it appears, disturb the molecular arrangement in some way, and so cause the plate to be once more sensitive to light.

This paper, which was listened to with great interest, was followed by one by Professor Boys on "An Application of Photography," and by one by Mr. Elder. Want of space compels us to postpone a review of these until a future occasion

The Camera Club dinner took place in the evening at the Criterion, and the company assembled filled one of the largest rooms. There were only four toasts: "The Queen," "The Camera Club," "The Press," and "The Visitors." The toast of the Camera Club was proposed by Capt. Abney, and responded to by Prof. Boys. That of the Press was proposed by Mr. Davison, who called upon Mr. Blane, of the *Times*, to respond for the general press, and upon Mr. Hepworth for the photographic press.

---

ENFIELD CAMERA CLUB.—At a meeting held on the 1st inst., Mr. S. H. Fry gave an interesting demonstration on "Bromide Enlargements"; he also developed two opals successfully, and showed a simple apparatus to be used for enlarging.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION, Champion Hotel, Aldersgate Street.—April 16th, Lantern Polariscope demonstration, Mr. J. J. Briginshaw; April 23rd, demonstration on "Light," Mr. W. E. Debenham.

THE Astronomers' Congress held a meeting at Paris on the 1st instant, the sitting being devoted entirely to the discussion of technical details connected with the proposed photographic mapping of the heavens. Among those who took a prominent part in this discussion was Mr. Gill, of the Cape of Good Hope Observatory. Admiral Mouchez acted as president.

PHOTOGRAPHY IN RUSSIA.—Though the Photographic Exhibition now being held in St. Petersburg is confined to the Russian Empire, the best exhibits, writes the *Daily News* correspondent, are of English goods. This is notably the case with cameras and apparatus. One interesting exhibit is a large series of views taken by the brothers Groum Greshemailo in their recent journey in the Thian Shan and in Chinese Turkestan, and alongside is the camera by which they were taken, and it is of London manufacture. As for the views, enlargements, and transparencies, they are fully up to the standard of such exhibits in England.

## Notes.

Mr. T. C. Hepworth, F.C.S., begs to announce that he is now the Proprietor and Editor of the Photographic News. He has also the pleasure of informing his readers that, commencing with next week's issue, the price of the paper will be reduced to twopence.

The river-side walk at Richmond-on-Thames is one of the finest of the kind in the kingdom, and, as it is within easy reach of the metropolis, where country walks are so fast being blotted out by the brick and mortar fiend, every effort should be made to keep its beauty unsullied. But the Richmond Main Drainage Board think differently, and apparently fancy that the general aspect of the riverside promenade will be much improved by the erection of sewer ventilators at regular intervals along the path. The exact shape which these ventilators will take has not yet been decided upon, or, at any rate, the design has as yet been kept from an expectant public. But probably the vertical brick-chimney shaft common to our manufacturing towns will be the form adopted, so that the sewer gases may fiud vent at a sufficient altitude to be innocuous, unless, indeed, the board should think it advantageous to offend the smell as well as the sight by shortening the dimensions of the hideous excrescences. Are there no photographers who will lift up their voices iu common with the other aggrieved ones to put a stop to this threatened blur on the beauties of Richmond?

Boards of drainage, health, and like objects, whose *raison d'être* is decency, seem to possess very little of that virtue when they get a chance to spoil a beautiful prospect, and it would be serviceable if we could have a supervising committee of artists to keep a check upon their doings. Such a check was certainly wanted at Hastings a short time ago, in order to prevent a most wanton disfigurement to that place. All who have visited the beautiful seaside town must have admired the view of the East Hill, with its bold sandstone rocks, relieved by the old fishing village nestling under their base. The picture is a beautiful one, which many an artist has been tempted to transfer to canvas. Now, what ought to be done to the man who, in cold blood, has erected an enormous chimney shaft close to the beach where this sandstone mass forms a headland jutting out to the sea? This has been done recently by some board or other, the object beiug to carry off the smoke from the furnace of a pumping station. If such a thing were a necessity, surely the shaft could have been concealed in one of tho many crevices in the rocks which abound at the spot. But no! the orthodox brick chimney is the right and only proper thing, and there it stands, a monument to tho want of reverenco for natural beauty of those who put it there.

In this month's issue of *Knowledge*, two capital reproduced photographs are given; the subject of one being the head of Rameses II., the Pharoah of the oppressive; and of the other, an intaglio picture on the front of a temple erected to the same king at Thebes. The recent excavations at Luxor—which is one of several villages which occupy the site of Thebes—have brought these interesting relics to light, the first having been discovered under a heap of rubbish in January last. The head appears to be in a wonderful state of preservation; indeed, the work looks as if it were fresh from the sculptor's chisel. In no part of the world has photography done more useful work than in the historic land of Egypt, and explorers would almost as soon dispense with their picks and shovels as they would with their camera. Unfortunately, it is very necessary that these recovered treasures should be photographed as quickly as possible, for, unless carried off and taken care of in the Boulak Museum or some other similar resting place, they quickly become chipped about and otherwise disfigured by globe trotters.

From the great to the minute is not a very sudden descent in matters photographic. We are glad to see that Miss Buckland, in her admirable paper on "Bacteria," contributed to the same journal, acknowledges the advantages which have been gained by photographing those unpleasant micro-organisms of which we hear so much in these latter days. She remarks: "These *micro-organisms*, so exceedingly small as to be absolutely invisible to the naked eye, have yet been so carefully observed microscopically, and so faithfully reproduced and enlarged by photography, that they can be studied in all their wonderfully varied forms; and the differences between them are sufficiently marked to be appreciated even by the non-scientific observer. Some resemble dots in various groups; some are twisted spirals; some look like chains; others resemble small bags, with strings attached; some look like branches of trees, whilst others are simply rods crossing each other."

Not much is seen or heard of Dutch photographers or photographs in London, but some of the professional workers in that country turn out excellent pictures. Some really good photographs, we are informed by a correspondent, were recently seen by him in the shop window of Mr. P. Stutz, in Maestricht, an acquaintance of the late Mr. Walery. Mr. Stutz turns out bromide enlargements of exceptionally large size on Morgan & Kidd's paper; two which he has on view measure fifty by thirty inches, and such photographs he sells to the public in Maestricht at £4 each. This cheapness is chiefly due to money wages being so much less in Holland than in England; what the real wages may be is quite another thing, for the lower money income has greater purchasing power among our neighbours who live in a country of low prices and low rent. One of the large photographs just mentioned is a portrait of Mr. Hollmann, the musician. For the development of these paper positives, Mr. Stutz uses eikonogen, which, in his hands, works better and quicker than does ferrous oxalate; he says that this developer was well known and appreciated throughout Holland a long time before its introduction to England. Maestricht is a city of 30,000 inhabitants, and possesses three professional and about a dozen amateur photographers. Its streets and the fronts of the houses, with true Dutch cleanliness, are scrubbed twice a week with brooms, and, in response to the remark that if the *men* had to do it this waste of hard work would soon be suspended, Mr. Stutz said: "I doubt it, for if I ceased to scrub my frontage by way of example, my neighbour would say, 'See what a dirty man lives next door to me!'"

---

An advance has been made in what may be termed ceramic photography. Examples of the application of photo-collography to china were shown by M. Raymond at the last meeting of the Societé Francaise de Photographie, and were much admired. The pictures are said to be vigorous, excellent in colour, and to rob the original photograph of none of its value in the process of firing. Hitherto, experiments to combine collotype work with ceramic photography have been unsatisfactory, but M. Raymond's specimens show that the combination is not only possible but successful.

---

A compliment is paid to photography in the statue of the Princess of Wales, by Prince Victor Hohenlohe, recently on view at St. James's Palace. The statue is almost a literal reproduction of the admirable portrait of the Princess taken by Mr. Lafayette, of Dublin, and representing her in the doctor's cap and university gown. This photograph, it is well known, has influenced fashion—not the only photograph, by the way, which has had this effect; witness the Duchess of Devonshire and Minnie Palmer hats, the Sweet Lavender, the Duchess of Fife, and the La Tosca aprons, and the Cleopatra girdles, all of which were made familiar to the public by the exhibition of the photographs of the original wearers.

---

With a recent number of *Land and Water* was issued a specimen of what Mr. G. Teesdale Buckell, the inventor of the process, calls "Prismatic Etching or Colour Photography." Mr. Buckell gives an article on the process, from which, however, very little definite information can be derived. We gather that the specimens are obtained by three printings, the primary colours alone being used, and the results being, we presume, regarded by Mr. Buckell as incomplete, since he says they "do not, of course, bear comparison with those printed with greater care," criticism may be withheld. An announcement in Mr. Buckell's article will, however, excite the curiosity of photographers. He says: "Quickness of the action of light upon a sensitive surface is very important. Without this it is absolutely impossible to bring the darkest shadows of one colour up in the negative, and at the same time keep the high lights of another colour inactive on the sensitive plate. In doing this I have used a sensitiser discovered by myself which acts so quickly that an 'instantaneous' (25) plate which has had one end placed in it for a minute, and then the whole of the plate exposed, will be fully exposed in the detail of the darkest parts before the highest lights in the undipped part have begun to change." If this be so, an important discovery indeed has been made. We hope Mr. Buckell will lose no time in establishing its truth. Modern photographers are at first apt to be sceptical in regard to alleged discoveries.

---

Anthropology is but in its infancy. But for this, we might have had some enthusiast proposing that paterfamilias, in addition to the onerous responsibility at present cast upon him by the census as "head" of the household, should furnish the authorities with photographs of himself and the members of his family. Mr. Francis Galton would, we are sure, endorse the idea. The material for study afforded by several millions of photographs of families, extending in many cases over four generations, would be, in its quantity, rather appalling; but the anthropological student is not likely to find fault with it on this account; nor, indeed, would the photographic profession. The only stipulation, perhaps, the latter would like to insist upon, would be that the photographs should be taken to scale by professional photographers, and not left to the tender mercies of the amateur, of which class every household now boasts a representative.

---

Photographic reproductive processes are now so numerous that the nomenclature has become a little puzzling, and before long the subject will need a dictionary of terms all to itself. Quite recently the artistic world has been amused by the efforts of Mr. Joseph Pennell to "draw" Professor Herkomer into giving an explanation as to what he means by an etching. Professor Herkomer, however, refuses to speak, and so an interesting contribution to the history of engraving is lost. We believe that the controversy —if, indeed, it can be styled a controversy where only one side is heard—arose out of some "artist's proofs" of an "etching" by Professor Herkomer. Mr. Joseph Pennell, himself an authority on such matters, declares that these so-called "artist's proofs" are not worth the money demanded for them, and that the subscribers have not been treated fairly.

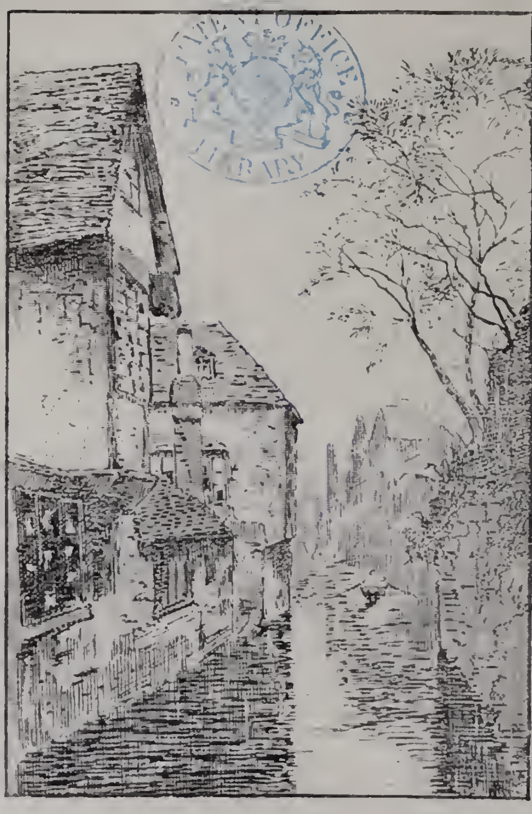
---

Mr. Pennell says that what Professor Herkomer chooses to call an etching is a photographic reproduction of a drawing touched up when on the plate with a needle. This is not Mr. Pennell's idea of etching, and most people will agree with him in thinking that an etching should be done entirely with a needle on a plate from which only a limited number of impressions can be taken. One would like to know by what name Professor Herkomer calls his process. Photo-etching would seem to meet the case. If a title has not yet been given, no time should be lost in supplying the deficiency, so as to prevent a recurrence of the misconception of which Mr. Pennell complains. Clearly, when any number of impressions can be obtained from a plate, it is not quite fair to charge an extra sum for "artist's proofs."

## A DETECTIVE SHOT.

The above heading looks as if it were taken from the contents bill of one of our organs which represent the "new journalism," but our readers will know that we are not prone to indulge in sensational matter, and that we refer to something far less exciting than the shooting of a policeman. "A shot," in photographic parlance, is a term which is now well understood, and we use it to call attention to the advantage occasionally secured by the use of a hand, or, as it is more commonly called—or mis-called—a "detective" camera.

A large number of persons look upon cameras of this kind as mere toys with which to while away an idle hour, or to perpetrate some practical joke at the expense of a good-natured friend, but the thoughtful know well enough that the instrument, used with judgment by experienced hands, is capable of doing valuable work. But perhaps it has not been pointed out how useful such a camera becomes when certain circumstances preclude the use of a tripod stand. As a case in point, let us take the attempted practice of photography from a boat in a choppy sea. Even in smooth water it is difficult to set up a camera on its stand in a small rowing or sailing boat, and when the water is lively it is impossible to do so. We remember on one occasion, when several vessels belonging to the Fleet were at anchor in the Downs, we succeeded in photographing each vessel in turn from a small fishing boat by means of a camera of the detective type.



The annexed illustration refers to another occasion where the hand-camera came to the rescue in a case of difficulty. We were crossing the East Bridge at Canterbury, under which flows the river Stour—or a tributary of that stream, we know not which. Often before had we admired the pretty peep at the queer old houses, with their reflections in the water, and once we had tried to photograph the view. But there are high railings to this bridge, and, to take the view, it is necessary that the camera front should be brought right up against them. Now, anyone who has struggled and wrestled with a tripod under such circumstances, will know well enough that the legs will assume every position but that desired by the operator; and that even if the lens be persuaded to project through the bars, it will either point towards the sky, or downwards towards the earth. It is, in fact, unmanageable, and the task is given up in disgust. Certainly one might take the camera off its stand, and fix it on a clamp attached to the railings; but clamps, useful things as they are, are not usually carried by photographers, for they are seldom wanted. But with our hand-camera, with which we were happily provided on the next occasion when we passed that way, all difficulty was at once removed. We held it rigidly against the bars for a moment, touched the button, and the picture was taken. There are many such nooks and corners in and about our old towns and cities which have not yet been photographed, because of the difficulty in finding room for the camera in the only position from which the view is worth looking at. We feel confident that in many of these cases the difficulty might be surmounted by the means which we have indicated, and the illustration is shown by way of emphasising this truth.

The picture in question has little archæological interest; it is merely a picturesque memorandum of a well-known view from the High Street, at Canterbury. The overhanging house on the left—which is evidently a very old one—is occupied as a dyer's; and the larger building seen in the distance on the right is a portion of the Blackfriars Monastery. Portions of this building are also remaining on the other bank of the river, but they are not visible in the photograph.

## THE WHEEL PUZZLE.

That able journal, *Wilson's Photographic Magazine*, has been puzzling its readers with the old question why the top of a wheel moves faster than the bottom, so as to give a less sharp image in photographs. The editor says:—

The veritable flood of explanations which has come down upon us impresses us with a realising sense of our responsibility as the editor of a scientific magazine, and with the awful readiness on the part of some of our vigilant subscribers to bring us up to trial should we slip or trip. From the beginning it was not our intention to ask our readers to go into the discussion of a problem which has excited scientists as much as the great coffer inside the Pyramid of Gizeh, for the last three hundred years or more—since the time, in fact, when Galileo discovered that if a point in the circumference of a wheel rolling on a plane surface were to trace its path upon a vertical plane placed beside the wheel, the path so travelled would form a very peculiar curve, which he christened the "cycloid."

As many as thirty diagrams have been sent us by various correspondents to prove their theories. Very strange to say, no two are alike. There are long lines of upward and downward curves; circles segmented; circles halved and quartered; triangles; semicircles crossed and recrossed; circles lapping one another; circles with many wicked-looking darts flying through the air at them; dotted lines rampaging over the paper like nebulæ; circles chasing one another along a track; and a model of a wheel with hand-power and diagrams and letters and tattoos all over its sides. They are accompanied by a great deal of sound, serious, scientific remarks, with the most of which we heartily agree. The communications came all the way from Cornell University (we *wish* we had room for this one for it is the very best, though it goes dead against us) to Boston (we beg Harvard's pardon for mentioning Cornell first), from Buffalo to Connecticut, and from New Hampshire to Milwaukee. The conclusion of the whole matter is about thus :

That a carriage-wheel, moving rapidly over the road, is, in one sense, like a crowbar (with one end resting on the ground) when impelled by, say, a man's arm, to move forward and backward. In that case the whole crowbar moves with the same speed, but the upper end, anyone can see, *moves more* than the lower end. Or, a wheel so moving may be like a hammer, and the contact of the wheel with the track is a series of blows, and each contact is a halt of that individual portion of the wheel. In that case, then, the upper, or *all* the other portions of the wheel, are moving faster than the point of contact. So, when photographing a wheel, there will, for that reason, be a blur, augmented by the lateral "wabble" of the wheel, unless it be that the shutter and plate are so quick that a sharp image could be had in spite of fate.

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

ASTRONOMICAL CONGRESS—PHOTOGRAPHIC SOCIETY OF DOUAI—FRENCH SOCIETY OF PHOTOGRAPHY—NEW HAND-APPARATUS—BOLLARD'S ACTINOMETER—WOODBURYTYPE PRINTS—ORTHOCHROMATIC PLATES WITHOUT SCREENS—MEDALS AWARDED BY THE CONGRESS—CRYSTAL PELLICLE—PELLICLE FRAME—AQUA-VERNIS—IDEAL DEVELOPER—BIBLIOGRAPHY: NEW PHOTOGRAPHIC JOURNAL—THE BANK NOTES AFFAIR.

*Astronomical Congress of Paris.*—The important work of executing the chart of the heavens is progressing. A new International Astronomical Congress has just met in Paris, with the view of making final arrangements. Moreover, all the preparations are complete, and in three months from the present work will have commenced in all observatories. It is proposed to photograph something like forty millions of stars, and one may judge, by this figure, of the extent of an enterprise which promises to be the greatest achievement of the science of photography. Captain Abney, prevented by indisposition from attending the first meeting, was able to assist at this second session. We do not know exactly what has been decided as to the nature of the sensitive plates; but it seems to us that the orthochromatic plate, sensitive to red, offers itself as capable of producing the best results.

*Photographic Society of Douai.*—A Photographic Society of recent foundation, that of Douai (North of France), has just started an original competition. It has published a humorous novel, entitled "Le Mortier de Marc Aurèle." This pamphlet contains, here and there, blank pages, and in that portion of the text corresponding to these pages are found passages in italics. This is to indicate certain subjects of which artistic interpretations are to be made by photography, and which are destined to illustrate the blank pages. The idea is curious, but none the less good; also the subjects indicated might give place to studies, or very interesting compositions. We are glad to see in this idea a great encouragement to the illustration of books by photography. We shall follow this competition closely, in order to learn and publish its results.

*French Photographic Society.*—The last meeting of the French Photographic Society has not presented any very salient facts. The following is a *resumé*.

*Hand Apparatus.*—The hand apparatus is never missing. This time we have that of M. Bourdier, a repetition of the Dubroni apparatus, or of any other with nothing new. M. Hermagis' detective camera, designed and made by himself, for amateurs, is principally interesting on account of a mechanism which presents the plate face to face with the object, and afterwards raises it and brings forward the next. The movement is very rapid, and one can, if necessary, expose in one minute several negatives. There is, lastly, the detective camera of Lond and Dessonieux, which is composed of parts borrowed from others. There is a magazine for plates of M. Hermann Fol, of Geneva. The arrangement, which permits the operator to use it without taking his eyes from the subject, belongs to Smith's American apparatus. That adjustment is good, but we prefer an apparatus in which the changing of plates is performed in the same manner as in the one presented by M. Hermagis—that is, without having to turn over the apparatus. M. Lande has expressed his preference for an apparatus which is rather heavy than light; rather voluminous than reduced to a very small volume; rather slow than rapid as to the changing of plates. All tastes are certainly admissible, and still more certainly indispensable, so that we may be permitted to take the contrary position, and hope that further researches may produce the greatest lightness, the least volume, and the most rapid working powers that are possible.

*Actinometer.*—A new actinometer has been introduced by Mr. Edward G. Bollard, of Chester, his own invention. It consists of a tube, quadrangular, and about fifteen centimetres round. One of the extremities is open; the other has a shutter, and contains a cardboard covered with phosphorescent sulphide of calcium; in the centre is a small hole. This cardboard leans against a blue glass. This is exposed to light by opening the shutter. In about a minute, the maximum of sensitiveness is attained by the phosphorescent matter; then it is closed, and the operator watches from the other end, but taking care to note the precise moment in which the observations began. At a certain moment the exterior light—across the hole on the phosphorescent glimmer, the hole which at first appeared black—disappears, and at that moment must be noticed how much time has elapsed during the disappearance of the hole. Not having tried this apparatus, we cannot judge of its value, but at first sight it seems as if the Watkins' exposure meter is a more precise and more complete means of arriving at the desired result. We never have much confidence regarding those optical actinometers in which the indications are variable, and which depend upon the state of fatigue of the retina.

*Woodburytypes with White Margins.*—M. Gravier has found worthy of interest, and with very good reason, the new Woodburytypes printed with white margins. He presented for the inspection of the assembly divers proofs thus obtained in the studios of the Woodburytype Company. This is real progress, he said, because the mounting of proofs destined for illustrations to books can thus be doue very much better; and this opens new possibilities to the Woodburytype Company, especially in France, where only two houses have essayed this beautiful process. He meutioned the splendid application which M. Léon Vidal has made of this to some polychrome metallic prints, which may now be better obtained with margins. The means employed to obtain this result is easily explained. It consists iu leaving a hollow space all round the relief, which in the print will give an elevated margin. The margin is grey, but it can be easily cleaued by a sponge slightly wetted with tepid water.

*Orthochromatic Plates without Screens.*—Orthochromatic photography is slow in making its way among amateurs and professiouals. This is because people fight shy of employing a screen. Mr. Léon Vidal points out the idea, certainly not new, but which he has tried with success, of completing the prescribed form of preparing orthochromatic plates by the addition of a yellow colouring matter, inactive with regard to the orthochromatic colouring matters, but capable of acting as a yellow screen. Picric acid neutralised by ammonia seems to answer the purpose perfectly. The trial made by him on ordinary plates, or on orthochromatic plates sensitive to yellow or red, as the case may be, have produced the most conclusive results. In this manuer the orthochromatic plate attains the elements of complete correction, aud there is no further need to trouble about a screen. If this method is adopted, manufacturers of orthochromatic plates will in truth be enabled to aunounce that their plates may be used without a screen. The plates already prepared can be completed as to the yellow colouring matter, by immersing them for two or three minutes in a bath of water saturated with picric acid, aud neutralised by ammonia until litmus paper turns no longer red. After this the plate must be passed through a bath of distilled water, theu placed to dry, resting on one corner on blotting-paper, and in absolute darkness.

*Medals awarded by the French Photographic Society.*—Perhaps the French Photographic Society has been a little too zealous in already awarding medals to those constructors who have applied the resolutions of the International Congress of Photography of 1889. As there is going to be uext August in Brussels a new congress rectifying the first, we think that it would have been more suitable to wait till after the second congress before thus makiug use of the first and, necessarily, incomplete resolutions.

*Pellicle Frame.*—The house of Jannin and Jumeau have presented their pellicle, "Crystallos," which they have brought to as complete a degree of perfection as possible. They have added a pellicle frame or carrier, and a protective coating which they call "aqua-vernis." Packets of pellicles have been sent to all the members of the assembly without exception. This pellicle, which is very supple and very sensitive (already well known to us), appears likely to render great service to photography. Au apparatus cau be made which will carry one hundred pellicles, whereas only twelve glass plates can be conveniently packed at present.

*Ideal Developer.*—A new developer, in bottles, has been brought forward; its uame is the "Ideal." We publish the fact of the presentation; but why do honour to a composition the formula of which is not explained? The developer may be excellent; it has a very good name, but we never have much faith in very pompous titles. The "Perfect" is one of the same kind, the "Excelsior" also. Generally, the true quality does not justify the title in these preparations.

*Bibliography.*—Some new books have appeared issued by M. Gauthier-Villars. They are "The Practical Treatment of Photographic Enlargements" (second part), by M. Trutat—well known to our readers—a work which is very conscientious, and full of useful information. "Amateur Photographic Work in Winter," by M. Chable, president of the Photo Club of Neuchâtel. This interesting work treats principally of photography on glass applied to lanteru slides and to the stereoscope. "Photographic Optics, a Study of the Objective," by M. Soret, professor of physics at the Havre College. "Manual of Amateur Photography," by M. Panajou, chief of the Photographic Service of the Faculty of Medicine of Bordeaux. We have also "A Bulletin of Photography," as well as that of the Photo Club. This publication appeared yesterday, and gives promise of being very interesting. On the 20th of April will appear the "Paris Photographer," edited and published by the firm of Nadar. This publication will be of a humorous character.

*The Bank Notes Affair* has just had its *denouement* in the correctional tribunal. M. Schlumberger has beeu condemued to pay a fine of 500 francs, and damages, for having counterfeited a bank note with the sole aim (legally frustrated, however) of proving that the bauk-notes of France are very easily counferfeited, and to show the necessity of rendering this imitation more difficult. M. Schlumberger is going to appeal. It seems impossible that he can have incurred a penalty, especially as he took the precaution to put 50 liards instead of 50 francs, to indicate strongly the difference between his proof and a real note.

---

Utilisation of Atmospheric Oxygen.—The last new process for separating oxygen from the atmosphere by means of calcium plumbate, has been further simplified, as the following summary of a paper by G. Kassner, which appears in the *Journal of the Chemical Society*, will show:—The present paper is a continuation of a previous communication, in which the author described a new process for the utilisation of atmospheric oxygen and the compounds on which the process is based. With regard to the preparation of the calcium plumbate, further investigations have shown that, instead of heating two equivalents of calcium carbonate and one of lead oxide, it is preferable to use a slight excess of the former, say about five per cent. In this way a spongy product is obtained, which admits of the conversion of nearly the whole of the lead oxide into plumbate. It is more advantageous to employ limestone instead of whiting, and it has also been found unnecessary to use mechanical contrivauces for keeping the mixture in the form of a powder during the heating operation. This may be effected in an ordinary or reverberatory furnace supplied with a good current of atmospheric oxygen. For the production of oxygen on a large scale, the author now recommends heating the calcium plumbate in an ordinary furnace in the presence of carbonic anhydride, when oxygen is freely given off, according to the following equation:—$Ca_2PbO_4 + 2CO_2 = 2CaCO_3 + PbO + O$. It will thus be seen that, by this process, unlimited quantities of oxygen may be obtained from one and the same material. The author considers his process superior to the methods of Brin and Boussingault for the following reasons: The formation of calcium plumbate is effected in the course of a few minutes, its decomposition by means of carbonic anhydride is complete, whilst the working expenses, cost of plant, and the value of material are extremely small.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

RETOUCHING ENLARGED NEGATIVES—EXPERIMENTS WITH RAPID DEVELOPERS—PRODUCING GROUND GLASS—BLEACHING GELATINE AND BLOOD-ALBUMEN.

*Retouching Enlarged Negatives.*—The following method of retouching enlarged negatives is practised by a well-known photographic firm of Berlin. *Papier végétal* is used for the purpose on account of its fineness and transparency. Two pieces of this paper of the size of the negative are cut out, one of them being mounted on the film side, the other one on the glass side of the negative. For mounting, the paper is at first slightly wetted, so that it will become quite tight after drying on the negative, when it is coated all round with glue, and transferred to the glass. In retouching, the larger portions of the negative which are too transparent are strengthened on the paper pasted on the glass side of the negative with powdered black chalk or plumbago, by means of a leather or paper stump. On the paper mounted on the film side of the negative, the flesh portions are equalised with the brush and Indian ink, bold effects of light being at the same time put in where it seems necessary. It is not at all necessary to work very accurately, since the light produces a softness of effect which could only be equalled by the most laborious retouching of the ordinary kind. The enlarged negative is then printed in the usual manner in the printing frame.

*Experiments with Rapid Developers.*—Mr. Victor Angerer, one of the most eminent photographers of Vienna, has made a series of experiments with different developers in order to determine which of them acts most energetically in the case of instantaneous exposures. For this purpose he used:—(1) The iron developer with the well-known accelerator; (2) the cristallos developer; (3) hydroquinone developer with ferrocyanide of potassium, according to the formula of Mr. Lainer; (4) the combined hydroquinone and eikonogen developer. The solutions were freshly prepared—except the cristallos developer—and the plates developed at the same time. The results were the following:—Developer No. 1 gave the fewest details, and a slightly fogged negative; No. 2. Plenty of details, but the lights too dense, no fog; No. 3. Plenty of details, very dense lights, and a slightly fogged negative; No. 4. An entirely clear and soft negative with very fine details, and with all the half-tones. The combined hydroquinone and eikonogen developer (No. 4), which was superior to all others, was prepared according to the following formula:—

*Solution* No. 1.

| | |
|---|---|
| Distilled water ... ... ... | 1,250 c.c. |
| Potassium sulphite... ... ... | 150 grammes |
| Eikonogen ... ... ... ... | $22\frac{1}{2}$ ,, |
| Hydroquinone ... ... ... | $7\frac{1}{2}$ ,, |

*Solution* No. 2.

| | |
|---|---|
| Water ... ... ... ... | 250 c.c. |
| Potassium carbonate ... ... | 75 grammes |

For use, five parts of solution No. 1 were mixed with one part of solution No. 2. The above experiments have been published in *Photographie* (1891, No. 4).

*To Produce Ground Glass.*—The following process to produce ground glass has been recommended to me by a professional photographer. A cup is filled up to one half with water, to which some emery powder is added. Stir well, allow to stand for about five minutes, and decant into another cup. Allow to stand again for five minutes, and decant the fluid into a third cup. In each of the cups remains a sediment of emery powder of various degrees of granularity. Take a well-cleaned glass plate, and commence to grind it with the coarsest grain; proceed with the grain of the second cup, and finish with the finest one. A semi-transparent glass plate of exceeding fineness is obtained by this method.

*Bleaching Gelatine and Blood-Albumen.*—M. Widmer, chemist, of Wiesbaden, publishes the following method: To 100 parts of the material in a hot concentrated solution, 1 part of powdered zinc and 1 part of oxalic acid are added. The mixture is well and continuously stirred, and the mass kept hot. By this method gelatine may be obtained more colourless than by any other. It will be evident that the proportions of the zinc and of the oxalic acid vary according to the colour of the original material, and the desired colour of the product. In the case of blood-albumen, it is necessary not to heat above 122° F., in order to avoid coagulating.

---

ROYAL INSTITUTION OF GREAT BRITAIN.—At the general monthly meeting on April 6th, the following were elected members: Mr. William Boyle Barbour, M.P.; the Right Hon. Lord Randolph Churchill, M.P.; Mr. C. E. H. Chadwyck-Healey, Q.C.; Mrs. C. E. H. Chadwyck-Healey; Mr. William Frederick Hamilton, LL.D.; Mr. William Robert Lake; the Rev. Edward G. C. Parr, M.A.; Messrs. Thomas Slingsby Tanner, Charles Humphrey Wingfield, and Latham Augustus Withall.

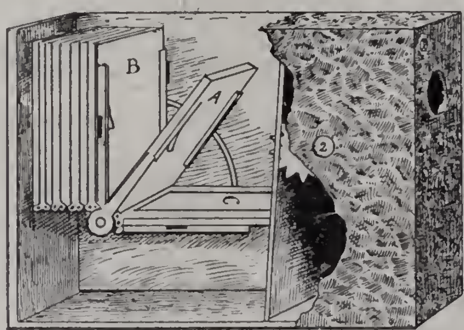
PICTURES OF NORWAY.—Mr. Sturmey gave last week before the Camera Club an interesting account of a tour in Norway, illustrated by about 100 lantern slides. These pictures, he told his audience, were taken on various makes of plates and films, and many of the negatives were executed under the wettest of skies. Starting from Leith with a large party of excursionists, Norway was touched—as is usual with tourists—at Bergen. The views of Bergen harbour, with quaintly shaped boats laden with dried codfish and wood, were very effective, and so also were the street views of the same town, a noticeable feature in them being the heavily wired telephone poles, which tell of far greater advances in this mode of communication than we can boast of in London. The views of Horgheim, and other places in the Romsdal Valley, must also be commended. But the camera must necessarily fail in giving a truthful interpretation of precipices which tower 3,000 to 4,000 feet above the houses. Mr. Sturmey, in considering this part of his subject, urged upon visitors to Norway the necessity of taking with them wide-angle lenses, otherwise many of the pictures which they take must lead to disappointment. Another point advanced was the great usefulness in Norway of a hand-camera, with which many passing shots from the steamer—of boats, fjords, cloud effects, &c., can be taken. Indeed, it seemed as if the majority of Mr. Sturmey's views were taken in this way without a tripod. Many of the pictures shown were most interesting from a geological point of view, and were taken, we understand, at the suggestion of a geologist who formed one of the party. Among these subjects were raised beaches and terraces, which gave evidence of former water levels, and notably a large expanse of polished and grooved rock with erratic blocks left behind by ancient glacial action. The waterfalls—some with a sheer fall of more than a thousand feet—of course formed a principal feature in this interesting collection of lantern slides. There were also shown the primitive, hut-like mills common to Norway, and found on nearly every stream. Beyond these we had a glimpse of the customs of the country and the inner life of the people which lent the necessary human interest to a very fair lot of pictures. The chair was occupied by Sir George Prescott, and there was a large attendance of members of the Club.

## MAGAZINE CAMERA.

The following description of Messrs. Hetherington and Hibben's magazine camera is taken from *Wilson's Photographic Magazine:*—

The engraving below is of a new hand magazine camera, which curries for public favour with a number of conveniences that, even in these days of very complete and perfect cameras, have not been before provided. It is light and compact, and, although always ready for instant service, it never fires off prematurely. This latter fault of many cameras is here well corrected. A button is a good thing to have to open the exposure, but, like a great many users of cameras, it is apt to go off before all things are ready. Sometimes an instant more of waiting would prevent failure and insure success. A button that yields to the slightest pressure and opens the lens more or less, is much more apt to cause one to spoil a plate than a button that does not open the lens until the pressure upon it is released. There is abundance of time, very often, between the time a button is touched by the finger and the instant the pressure is released, for the subject to move, the wind to rise, a cloud to obscure or change the light, or for one to change one's mind as to choice. Hence, a button that jumps at the first signal may often spoil everything, while the chances are that, if it does not jump until you let it go, it will be surer to secure a good result. This new camera works under the release of the button from the pressure.

We also call attention to some other of its characteristics, which will be made more understandable by reference to the engraving. Referring to the cut, A, B, and C are thin metal




leaves. There are twelve or more of these, as shown, all hinged or linked together by links, which are part of the construction of the carrier. These links are pivoted together by small rods, the ends of which project about one-eighth of an inch at each side. Their projecting ends travel in a slot in a metal plate on the inner side of the box, and these slots form the guides in which the hinges travel. This construction, giving entire control of the plate, is one of the chief claims of the patent on the Magazine—the slot turns at the first plate-holder, thus making a right-angle. When the pivots of the hinges approach the turning-down place of the slot, they will, of necessity, turn down and follow it, thus carrying the plate-holder through an arc of ninety degrees. The act of doing this draws forward the succeeding holder until it occupies the plane just vacated by the one turned down. A stop darts through the opening on the side of the camera and holds it firmly in place. The carriers are thrown down by turning a button which actuates a thin arm that engages with the sides of the holders. There is one of these on each side of the box. When the button is turned back for the next holder, the turned-down plate-carrier is left as shown, sensitive side down. The holders are flanged backward (not shown in cut), lapping upon each other like the shingles on a house-roof, and completely protect the plates, both exposed and unexposed, from any stray light during subsequent exposure. This is very necessary, as we have all been taught by experience. As each plate is turned down, it engages the star-wheel and revolves it, thus causing successive numbers to appear on the side of the box, as shown. The focussing device is entirely new in manner and mechanism, always in sight and touch. The shutter is "ever-set." Not less than one hundred consecutive exposures may be made without the resulting negative showing any variation of speed. It can be reset in ten seconds. The shutter works with release of pressure on the button, an advantage that will be appreciated by all experts in the use of the hand-camera. For example, you want an effect of light, a dash of sun, or you wait patiently for any moving object or person to occupy a certain position in the field of the lens. The opportunity offers, and, in the excitement of the moment, a hurried jab at the button is more than likely to result in an unsatisfactory plate; whereas, with the button pressed, you have but to "let go" at the right moment. The lens used is known the world over, and was chosen after thorough tests as being the most desirable for the purpose, the question of cost being subordinated. The box is very simple and plain externally—purposely so. It has been successfully used in the crowded Hebrew, Italian, and Chinese quarters of New York, as well as on Broadway, without attracting attention. It has seen service from the beaches of the Atlantic to the Indian reservation of the North-west. With the box tucked under the arm, there is nothing to do but turn down a plate—as easily as you would turn on the gas—and "let go" the button. No shutter to set, no doors to open, nothing that requires any examination or any unusual movement of the body or hands. The stops are changed from the bottom of the box by a device that does not require to be seen in order to control. The entire working parts of the camera, except the magazine, are attached to a grooved front-board, which can be readily detached for examination. It is believed to be the smallest, lightest camera of its class now on the market, and is the work of a thorough mechanic and skilful photographer.

## TESTING OF LENSES AT KEW OBSERVATORY.

The Kew Committee of the Royal Society give notice that they will be prepared, after May the 1st, to receive at the Kew Observatory, Richmond, photographic lenses, for the purpose of testing them and of certifying their performance, under the following conditions:—

1. The lenses are to be delivered either at the Kew Observatory, Richmond, or to the Secretary of the Horological Institute, Northampton Square, London, E.C.; or to Mr. R. Strachan, of the Meteorological Office, 63, Victoria Street, Westminster, S.W.

Every reasonable care will be taken of the lenses, but all risks attendant on their transit to and safe custody at the places designated in the preceding paragraph must be borne by the sender of the lenses.

2. No certificate will be granted for a lens unless it bears a distinguishing number on its tube. The maker's name need not be engraved.

3. Lenses may be tested before they are fitted into cameras, provided they are numbered, and are accompanied by their flanged mounting. They cannot, however, be received for examination if their diameters exceed four inches, or the equivalent focus thirty inches.

4. The lenses are tested in sets, and the trials begin on or about the 1st and 15th of every month. Lenses intended to be submitted to such trials should be deposited either at the Observatory or at the receiving houses *at least three days before either of those dates*, accompanied by a duly attested form of entry, specifying the class of test to which the lens is to be subjected.

5. The fee for testing each lens is for Class A 10s. 6d., Class B 2s. 6d. It will be payable when the lens is ready to be returned.

The Superintendent may decline, at his discretion, to receive any lens which he may consider unfitted for examination.

6. Duplicate certificates, with the customer's own name filled in, can be supplied to makers at a charge of 1s. each. The original certificates must, however, be returned whenever an application is made for duplicates.

Details of Trials to which the Lenses are Submitted during Testing.

*For Class A Test.*—Determination of the length of equivalent focus. Size of effective aperture with every stop in terms of focal length. Angle of field of view, and size of plate effectively illuminated. Number of external reflecting surfaces. Coincidence of visual and chemical foci. Presence of flare spot. Workmanship of surfaces, structure, and degree of transparency of glass. Centreing in mount. Defining power. Relative quality of illumination in different parts of field. Amount of astigmatism or optical distortion.

*For Class B Test.*—Determination of the length of equivalent focus. Size of effective aperture with largest stop. Angle of field of view. Size of plate effectively illuminated. Coincidence of visual and chemical foci.

Note.—All lenses certified at the Kew Observatory will be marked with a monogram composed of the two letters K and O, A or B, and a registered number, unless the mounting is such that the operation of engraving cannot be performed with safety to the lens. An additional fee of 6d. will be charged for engraving the monogram and number.

Applications for forms for the entry of lenses for testing, and all other correspondence, should be addressed to the Superintendent, the Kew Observatory, Old Deer Park, Richmond, Surrey (Test Department).

Office hours—10 to 4; Saturdays, 10 to 1.

*N.B.*—The Observatory stands in the Old Deer Park, and is reached through "Fuller's Gate," which is about one hundred and eighty yards distant from either of the two *Richmond* Railway Stations (*not* from either of the Kew Stations, which are two and three miles distant respectively).

## THE LATEST USE OF PHOTOGRAPHY.

BY J. F. S.

Multitudinous as are the practical applications of photography, yet hardly a day passes but some new use or application is heralded in the daily press. So great is this range, that it gravitates all the way from the discovery of celestial phenomena millions of miles from the earth, down to the designing adventuress in Chicago who had her love letters photographed for use in a breach of promise suit, for fear that the originals might be written in unstable ink. The latest announcement now comes from Germany, and the scheme will, without doubt, be improved upon in the future.

The opening scene is laid in a railway train running from Stettin to Berlin. Among the passengers was a young man, Isidore Grünschnabel, the only son of a wealthy clothing dealer in the former city, who, in addition to his extensive business, prided himself upon being a "Geheimer-geheim commercien rath" of his native town.

The young man was on his way to the imperial city with a well filled wallet, nominally to secure some job lots for his father's establishment; but in reality, as it afterwards turned out, his main object was to see *life* in Berlin, which city, it may be remembered, is itself on the Spree.

In the train, this verdant sciou of an old but commercial house became acquainted with a fellow-traveller—one Fritz Schnepperle—who was by birth a Berliner, by occupation a travelling "commis," or salesman, and, like many of his class, a sharper, always open for opportunities. During the journey, the young Grünschnabel made a confidant of his new-found friend, which culminated in asking him to act as his guide through the intricate mazes of the metropolis of the Hohenzollern. Well and attentively did Schnepperle listen, and acceded to his friend's request without much urging.

On their arrival in Berlin, the young Stettiner, under the guidance of his new-found friend, devoted himself so assiduously to his studies that, ere twenty-four hours had rolled around, young Grünschnabel was confined to his room at the hotel with a pronounced headache.

The patient reader will, no doubt, ask, "What has all this to do with photography?" A little patience, and the *denouement* will bring the answer.

The designing companion, Schnepperle, after leaving his young companion helpless in bed, now sent a telegram to Grünschnabel, Senior, stating that he had run across some large job lots, but was short 500 marks cash, which he wanted sent by return mail without delay, signing the name of Grunschnabel, Jun.

The father, who is also an honorary member of a photographic society, at once sent the money to the designated postal station in Berlin; but, with a latent suspicion that perhaps all was not right, he mailed at the same time a letter to the official at the station, enclosing a photograph of his son, and requesting that the money letter be delivered only to the original of the enclosed photograph.

The following day the personator called at the station for the letter. The official, Herr Spührnase, who entered into the spirit of the matter, compared the person with the photograph. A glance was sufficient, and the ever-present policeman was at once called into requisition.

On the following day the prisoner was arraigned before the Imperial Schwur Gericht, and, on being confronted with the evidence and photograph was found guilty of attempted swindle, and sentenced to a term of six years at hard labour in the penitentiary at Spandau.

During the course of the trial, the judge, Herr Von Bürstenbinder, took occasion to pay a high tribute to photography, and the great aid which it lent to the police department in detecting criminals and assisting in the administration of justice. In the present case, the honourable judge stated that photography had proven itself capable of even a higher scope, viz., as an agent to prevent the successful accomplishment of a well-laid scheme to fraudulently obtain a sum of money. After congratulating the postal official upon his vigilance, the judge stated that he hoped to see the day when photography would be regularly used in connection with identification in financial transactions; further, that here opened a field which, so far, had been overlooked in the past; also that he personally would request the "Photographische Verein zu Berlin" to formulate a practical scheme for the purpose, and bring the matter before the Imperial Chancellor for adoption throughout the length and breadth of the German realm.

Photographic Exhibition in Brussels.—Intending exhibitors are notified that the lists will be closed on the 1st May. Communications should be addressed to M. C. Puttemans, Ecole Industrielle, Boulevard du Hainaut, Brussels.

## Patent Intelligence.

### Applications for Letters Patent.

5,591.—Wilhelm Heinrich Conrad Bernitt, 45, Southampton Buildings, London, "Improvements in Apparatus for Producing and Delivering Photographic Pictures in exchange for Coin deposited therein."—*March 31st.*

5,627.—Richard Warren Stewart, R.E. Office, Devonport, "Taking Photographs of Small or Large Angles up to 360°."—*April 1st.*

5,800.—Thomas Scott and James Davenport, 70, Deansgate, Manchester, "Improvements in Photographic Dark Slides." (Complete Specification deposited.)—*April 4th.*

5,833.—James Yate Johnson, 47, Lincoln's Inn Fields, London, "Improvements in the Manufacture or Production of Sensitive Paper for Photographic Purposes. (*Pierre Mercier, France.*)—*April 4th.*

### Specifications Published.

16,982. *October 28th*, 1889.—"Colours." C. H. Wilkinson, Colne Valley Works, Slaithwaite, Yorkshire.

Relates to a system of colouring in which a scale or octave of colour is arranged corresponding to the diatonic scale in music. Consists in setting the primary colours, red, yellow, and blue *(sic)*, to correspond to the notes C, E, G, of the common cord in the natural key, and then mixing these colours in proportions founded on the relative rates of vibration of the notes in the musical scale, in order to produce the remaining prismatic colours, orange, green, indigo, and violet, to correspond to the uotes D, F, A, B. Intermediate colours are obtained corresponding to sharps and flats by mixing the principal colours on each side of them. The ascending and descending octaves of these colours are produced by mixing them with certain proportions of white or black. The system comprises also diagrams of colour harmonies consisting of notes, chords, or scales, in ranges or keys corresponding respectively to the notes, chords, scales, and keys of music. The system is applicable for use by textile manufacturers, dyers, printers of colour ou calico, paper, floorcloth, &c., colour makers, paper makers, ink makers, painters, designers, artists, &c.

17,006. *October 28th*, 1889.—"Stereotype." D. Reid, 143, Flinder's Lane, Melbourne, Victoria.

Key for securing stereotypes to their base blocks. The key is composed of two pieces of metal secured by rivets, and having bent edges to fit the grooves in the stereo and base block. The edges may be bent to different angles to suit the dovetail of the grooves in the blocks. The plates forming the key are in short lengths, the upper ones breaking joints with the lower. The upper plates of the key are capable of slight lateral movement, the rivet holes being elongated for this purpose.

### Patents Granted in America

448,825. *December 4th*, 1889.—"Dissolving Shutter for Magic Lanterns." John Shannon, Wixom, Mich. Serial No. 332,600. No model.

*Claim.*—A frame for receiving and displaying pictures in a magic lantern, such frame having an advance and sidewise movement in either direction for bringing its ends alternately in position for display purposes. In combination with a movable shutter actuated through the movements of the frame, substantially as and for the purpose specified.

448,821. *January 7th*, 1891.—"Picture Frame." John F. M'Bride, Chicago, Ill. Serial No. 376,952. No model.

*Claim.*—In a picture-frame, the combination of a back, a front formed of a sheet of suitable flexible material cut to form sections bent back to produce the display opeuiug, having convex bulging margins, and ornamental fastenings, securing the sections at their free ends to the frame.

As a new article of manufacture, a picture frame, having the back and the front of sheet celluloid severed by a cross-cut through the centre, thereby forming V-shaped sections bent back to produce the display opening, having convex bulging margins and ornamental fastenings, securing the sections at their apexes to the frame, substantially as described.

448,692. *January 31st*, 1890.—"Implement for Mounting Pictures on Glass." Richard H. L. Talcott, Boston, Mass. Serial No. 338,752. No model.

*Claim.*—An implement for mounting picture sheets on glass, consisting of a suitable handle or stock haviug secured on and projecting from its forward portion a metallic plate having a thin and continuous rigid edge, and a sheet of rubber by its intermediate portion overlying said edge, and by its terminal portions extended therefrom and under tension.

The carrying body or stock provided with the kerf, the metallic blade or tongue inserted in said kerf, and the sheet rubber by its intermediate portion covering the edge of said tongue, and by its terminal portions confined upon the opposite sides of the stocks, substantially as described.

448,801. *February 18th*, 1890.—"Photographic Roll-Holder." Hermann G. Ramsperger, New York, N.Y. Serial No. 340,862. No model.

*Claim.*—In a roller-holder, a perforating device adapted to penetrate the film, and a measuring device adapted to enter the perforatious.

The measuring device held in contact with the film by spring pressure and adapted to enter the film.

In a roller-holder, a perforating device, a measuring device co-operating with the perforating device, and a lock actuated by the movement of the measuring device to lock one of the rolls.

The combination, with the supply and receiving rolls and the film support, of a perforating and measuring device acting at opposite edges of the film support.

The combination, with the supply and receiving rolls and the film-support, of a perforating device, a measuring device, and a common tumbler, or its equivalent, for actuating the perforating device and for withdrawing the measuring device.

## Correspondence.

### THE NEW RAPID IRON PROCESS.

Sir,—It will perhaps put to rest Mr. W. E. Debenham's conscientious scruples if the history of the discovery of the new sensitive compound is laid before the world. As Mr. Debenham is so anxious to know who was the discoverer—Mr. Friese Greene or myself—I may tell him we both claim a share in the discovery. We started upon the work by making a definite study of a series of experiments. These pointed out a direct line of investigation to be undertaken. Mr. Greene having special facilities for carrying out experiments, very speedily was on the right track, and followed it until the new sensitive compound reached its present perfect stage. In thus working together we have further succeeded in rendering the process more sensitive by a discovery I had the good fortune to make.

Having, as I believe, fully apportioned the respective shares in the credit of this discovery, I would like to add that you were right in calling attention in your issue of last week to an error which had crept into an article in *Nature*, attributing the discovery solely to me, whereas Mr. Friese Greeue's name should have been mentioned as well. At the lateness of the hour by which Prof. Meldola concluded his discourse, and my anxiety to get through with the experiments and not keep the audience unduly waiting, it did not occur to me, or I would have most certainly drawn attention to the omission of Mr. Greene's name. Frederick H. Varley.

*April 3rd.*

### NATIONAL PHOTOGRAPHIC EXHIBITION, APRIL, 1891.

Sir,—Owing to the decision of the Liverpool Exhibition Committee to keep their Exhibition open until the 11th inst., and as many of their exhibits are entered for the Crystal Palace, I beg to inform you that it will be impossible for the judging here to take place before Thursday, April 16th.

S. G. Buchanan Wollaston.

*Crystal Palace Co., Crystal Palace, S.E., April 6th.*

Photographic Club.—Subject for discussion Wednesday, April 15th, "Priuting on Emulsion Papers"; April 22nd, "The Keeping Qualities of Developers," and "A Special Selection of Slides," by Mr. Frank Haes.

# Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting on March 31st, Mr. Chapman Jones, F.I.C., in the chair, Mr. T. E. Freshwater showed his miniature lantern. A lantern display then took place, slides being contributed by Messrs. S. T. Chang, H. M. Hastings, Mawson and Swan, E. W. Parfitt, H. Chapmau Jones, H. R. Hume, F. Ashburner, W. England, and A. Mackie. Mr. T. E. Freshwater then exhibited some slides in his miniature lantern.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

*April 2nd.*—Mr. W. Coles in the chair.

Mr. Atkins passed round three negatives taken on the previous Monday—Bank Holiday.

Mr. J. R. Gotz gave a demonstratiou of toning of gelatiuochloride emulsion paper. He claimed that the paper was capable of producing any tone desired, according to the toning bath used. Some prints that had been previously exposed were then placed in various touing baths, and the results shown. The length of time the priuts remained in the bath materially influenced the colour. A bath of sulphocyanide of ammonia and gold was first used, producing purple tones. A bath composed of carbonate of soda and gold, although slow of action, gave a very good grey tone. Some fine sepia tones were obtained with platinum toning, but the bath that seemed to give the best general result was a combined toning and fixing bath. Mr. Gotz believed that when a thorough substitution of gold took place, the prints would be thoroughly permanent.

Mr. Everitt asked if Mr. Gotz would allow the prints to be submitted to the action of chlorine water.

Mr. A. Haddon thought this would be an unfair test, as the image might be quite permanent, and yet be soluble in chlorine water. The yellow in platinotype priuts was due to the iron not being properly dissolved out.

The action and tone of several other baths were shown, and examples of the toning produced.

Mr. Gotz also passed round samples of paper recommended for backing priuts after enamelling ; it prevented the mountant dulling the brilliancy of the gloss of the enamel.

PHOTOGRAPHIC SOCIETY OF IRELAND.

At a meeting held on Friday, 3rd inst., at 15, Dawson Street, Dublin, Mr. J. H. Hargrave, B.A. (hon. secretary), read an interesting and instructive paper on "Optical Properties of Shutters," and demonstrated, by means of blackboard and lantern slide diagrams, the various effects upon the light rays passing through the lens exerted by different makes of instantaneous shutters used in the following positions—viz., (1) In front of lens ; (2) between the combinations of a doublet lens ; (3) behind the lens ; (4) in front of the plate. Mr. Hargrave stated that a roller-blind shutter worked in the latter position was theoretically the best form, as it did not in any way affect the rays passing through the lens, but allowed every part of the plate to receive a uniform exposure.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

*April 3rd.*—At a general meeting held in Hauover Hall, the report for the past year was submitted, and stated that the year commenced with a roll of 63 members, the increase during the year had been 44, making therefore a present total membership of 107.

It was resolved that an entrance fee of 2s. 6d. be imposed on all elections after May 3rd next ; and that, as the Society is not able to obtain the use of Hauover Hall ou Friday evenings, the future meeting nights be the first and third Mondays in the month.

The following officers were then elected :—*President*—Mr. F. W. Edwards ; *Vice-Presidents*—Mr. Maurice Howell, Dr. Munyard, Mr. W. Rice, Mr. H. G. Banks ; *Committee*—Messrs. Boxall, Farmer, Fitness, Fellows, Groves, Herbert, Kelly, Lyon, F. Webb ; *Hon. Treasurer*—Mr. A. E. Whitby ; *Hon. Secretary*—Mr. S. W. Gardner, 7, Barry Road, East Dulwich.

The balauce sheet showed cash in haud £4, aud fixtures to the amount of £3.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

On Saturday, the 4th inst., a meeting of the members and friends of the Society was held at Beale's Restaurant to bid farewell to the president, Mr. J. Humphries, F.S.A., who is about to leave London for Glasgow, where he will in future reside. A smoking concert was organised ; Mr. W. T. Goodhew, vice-president, in the chair. The event of the eveuing was the presentation of an illuminated address bearing the signatures of the members, to Mr. Humphries. In making the presentation, the Chairman said that the success which had always attended the Society had been to a great extent due to the business abilities and amiability of Mr. Humphries ; and in bidding him farewell, the members felt that they were losing an officer whom they could not replace.

Mr. H. Walker, vice-president, in eudorsing Mr. Goodhew's remarks, said that Mr. Humphries' amiability was the velvet glove that covered an iron hand, ever ready to direct, and firm to control.

Mr. Lewis Medland, as a visitor and old friend, joined in wishing Mr. Humphries success in his future career.

Mr. Humphries, in reply, said that the work he had done for the Society had brought its reward in the kindly feelings it had generated. Although he could no longer atteud the meetings, he would always remain a member, and cherish the warmest feelings of friendship for those with whom he had worked.

RICHMOND AMATEUR PHOTOGRAPHIC SOCIETY.

The first field-day of the season took place on Easter Monday, when nine members visited Cobham and Ockham, and, in spite of the windy weather, succeeded in getting some good negatives.

Friday, the 3rd inst., was a lanteru night, when Mr. Faulkuer presided, aud Mr. Ardaseer showed and explained the new pneumatic shutter of Adams' "Ideal" hand-camera.

Mr. Cembrano lent his lantern, aud slides by the following members were shown : Commander Tailor, Messrs. Ramsay, Hunter, Ardaseer, Richardson, Faulkner, Perry, Bickerton, Garrett, and Cembrano, as well as a set of views of Windsor Castle by Mr. Brooks, of Reigate.

HOLBORN CAMERA CLUB.

The arrangements for the present mouth are as follows :—To-night Mr. Traill Taylor will lecture on "The Artistic Composition of Photographs." To-morrow the Club has a field-day, and will visit the beautiful park at Highgate recently given to Londoners by Sir Sydney Waterlow, the London Couuty Council having given permission for a party of not more than twenty-five to visit that beautiful estate on this occasion. The members will meet at St. Joseph's Retreat on Highgate Hill at 3 p.m. Friday uext is an iustruction night, when general hiuts to beginners will be giveu by Mr. Brocas ; aud on Friday, the 24th, Paris Exhibition slides will be shown by Mr. Meru. Prizes are offered for the best pictures takeu at the Club outings.

LEEDS PHOTOGRAPHIC SOCIETY.

On Thursday eveuing, the 2nd inst., Professor E. H. Jacob, M.A., M.D., read a paper ou "Winter Photography" before the members of this Society, and in the course of his remarks said that photography iu the winter—that is, when trees had lost their leaves—was far too much neglected by amateurs. He dwelt on the greater truth to nature of winter photographs, the values of the almost monochrome pictures being more correct than views which contained a profusion of colours, mostly green ; while from an artistic point of view, there were a large number of spring and winter views of great beauty. As subjects for pictures, he instanced: (1) Buildings, the greater part of which are frequently in summer obscured by trees or foliage, and interiors iu the same way are often shaded by trees. (2) Suow-scenes or pictures taken during a hoar-frost, which formed some of the most beautiful subjects for the camera. (3) Trees ; here the photographer had a great advantage over the artist with the brush, for the winter trees could be rendered with absolute accuracy; he thought people were unaware of the great beauty of most trees without leaves, especially the birch, the elm, and the oak; besides the artistic value, a collection of good photographs of leafless trees would be most useful from a botanical point of view, and should find a place in the collection of every school of botany. Some of the most beautiful trees he had seen were to be found in Nuneham Park, near Oxford, and in Studley Park. (4) General winter landscapes, where interest was given mostly by the conformation of the land, hills, buildings, or by contrast of bare trees with evergreens. Seaside views were better in winter than in summer, as the waves and sky were more varied. Dr. Jacob illustrated his paper throughout by a series of lantern slides of winter scenery, including a number of fine forest trees from the parks referred to above.

Mr. J. W. Addyman, B.A., brought before the members an account of the recent investigations of Col. J. Waterhouse, B.S.C., Assistant Surveyor-General of India, respecting electro-chemical reversals with thio-carbamides, the principal points established seeming to show:—(1) That the same kind of reversal of the deposit on silver bromide films can be effected by a developer containing thio-sinamine, both chemically and electrically; (2) that the reversal of the photographic image on such film by thio-carbamides is to a great extent, if not entirely, due to electro-chemical action; (3) that the development of the photographic image on silver bromide films is accompanied by electro-chemical action.

---

Croydon Microscopical and Natural History Club (Photographic Section).

*Friday, April 3rd.*—Mr. Edward Lovett in the chair.

Mr. A. R. Dresser, in a paper entitled "The After Part of Hand-Camera Negatives" (illustrated), gave a brief outline of the method he adopted for developing hand-camera negatives, entered largely into the intricacies of solar enlarging and making slides, and explained and illustrated a simple arrangement for enlarging or copying a negative that had been taken askew, the carrier holding the plate to be copied rotating within a turntable.

A large number of fine enlargements made from quarter-plate negatives were exhibited, and a good number of slides were passed through the lantern, and were well appreciated by the members.

---

Glasgow Photographic Association.

*March 19th.*—Mr. J. Craig Annan, vice-president, in the chair.

Ex-Provost Clark, Paisley, who was the lecturer for the evening, gave an interesting and graphic account of "Scenes in Ireland," with limelight illustrations. Views, in addition to those of scenery, were also shown descriptive of recent events in Ireland.

*April 2nd.*—The sixth general meeting of the session was held, Mr. William Lang, jun., F.C.S., president, in the chair.

Mr. James Gardner gave a practical demonstration of the application of the air-brush for working up bromide enlargements, and prints were shown illustrative of the method.

Mr. William Hume, Edinburgh, explained the construction and uses of his cantilever enlarging apparatus, and by its means showed a series of physical experiments projected on the screen.

Mr. William Lang, jun., F.C.S., read a paper on "Lantern Slide Making by the Woodbury Process," and gave a demonstration of its working.

Thereafter a number of members' slides were passed through the lantern.

---

Received.—Adams and Company's Catalogue and Annual for 1891, containing portraits on three different kinds of photographic paper, first of the series being that of Mr. W. H. Harrison, late Editor of the Photographic News.——*The Photographic Quarterly* for the current month, with a frontispiece, "The Love Letter," being a Woodburytype reproduction of the picture by J. E. Austin, which received a medal last year at the exhibition at Pall Mall.

## Answers to Correspondents.

*All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

S. D.—"*La Belle Bretonne.*" The address of Mr. Arthur Burchett was given in the catalogue as Willoughby Lodge, Hampstead, N.W. A fairly good reproduction appeared in the February number of the *Art Journal*.

Competition.—*Medals in Show Cases.* There is abundant precedent for it, but the display of medals (given for genre) in the same show-case with ordinary professional portraiture is a little misleading to the general public. You say the genre groups were never published, but surely copies were shown and a few orders booked. Whether this was the case or not, the possession of medals betokens a certain grade of art excellence, which, it is presumed, governs the whole work of the establishment. Your contention is that the particulars of award should be stated; but how would Mr. Robinson, for instance, go to work to afford this information, and would the public, even then, be very greatly enlightened by the mention of such particulars? After all, it is open to you to take the same course, and then, if successful, you can appear on a level with your competitor.

Pharm.—*List of Members.* A newly revised list has just been issued by the Photographic Society, showing the dates of election, from which it appears that there are *eight* original members. Mr. H. Perigal, F.R.A.S., who completed his ninetieth year on the 1st inst., is the father of the Society. A fine portrait of the venerable gentleman, taken by Mr. H. S. Mendelssohn, was shown three years ago at the Pall Mall Exhibition. Mr. Glaisher joined the Society in the second year of its existence; Messrs. Henry White and G. C. Whitfield in 1855; Sir George Stokes in 1856; and Messrs. Francis Bedford, Sebastian Davis, W. Peters, H. P. Robinson, and Josiah Spode in 1857; with Colonel Mitford in 1858. The names of the original members are George Shadbolt, W. Bois, F. E. Currey, W. Dillworth Howard, George Shaw, E. O. Tudor, and Sir Percival Radcliffe, besides Mr. Perigal already mentioned.

L. P. (Cheltenham).—*Negative Varnishes.* Messrs. Mawson and Swan have two qualities. The amber in chloroform can be had of Messrs. R. W. Thomas and Co., and the original Soehnée varnish of Messrs. Marion and Co.

Optics (York).—*Heavy Liquids for taking Specific Gravities.*

| | |
|---|---|
| Oil of vitriol ... ... ... ... | 1·84 |
| Methylic iodide ... ... ... ... | 2·20 |
| Concentrated arsenic acid ... ... ... | 2·50 |
| Mercuric potassium iodide ... ... ... | 3·20 |
| Mercuric barium iodide ... ... ... | 3·60 |

Guinand's flint glass and the heavy English qualities have specific gravities standing between those of the two last-named liquids, whilst Bohemian glass and common crown (without lead) seldom exceed 2·5 specific gravity. It would be easy, therefore, to test your specimens in the first instance by seeing whether they sink or float in the mercuric solutions. "Toughened glass" is rapidly corroded by sulphuric acid, which has no such effect upon ordinary flint or crown. It might not be advisable to leave the heavy glasses long immersed in the double iodides.

F. I. C.—*Messrs. Greene and Varley's New Sensitive Salt.* We have no information beyond that published in the short leading article, and report of Prof. Meldola's second lecture, which appeared in the News of March 20th. If confirmed, the discovery is one of supreme importance, and its spectrum examination will become a matter of very great interest, to see where the zone of maximum activity lies. The finished print is vigorous and excellent in colour, almost like the platinotype.

M. M. & Co.—*Gelatinised Parchment.* M. Raymond's agents in this country are The Autocopyist Company, 72, London Wall, E.C.; Messrs. De la Rue and Co., of Bunhill Row, also manufacture the vegetable parchment.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1702.—*April* 17, 1891.



CONTENTS.



## SUTTON'S PROCESS FOR PRODUCING A PRINTING BLOCK.

This being the age of pictorial illustration, many thousands of workers must be constantly engaged in the work of converting drawings and photographs into such a form as will fit them for reproduction in an ordinary printing press. We use the word "ordinary" because the illustrations to which we refer are those expressed in lines or dots—such pictures, we mean, as the zincographic and Meisenbach processes are able to produce, and which, at present, are alone suitable for universal press work. The higher class of pictures, which come under the head of collotypes, Woodburytypes, photogravures, and other designations, we do not here deal with, because they require special appliances which are quite outside the *entourage* of the common printing office.

The thousands of men—artists as well as skilled artisans—who owe their bread to this very recent development of photography are, of course, interested in every change which may take place in the introduction of new processes or the modifications of old ones; and, when the fact is announced that a method has been devised for obtaining an electro printing block direct from the surface of an ordinary gelatine plate, it is apt to cause a flutter in the minds both of *employé* and employer—the first, perhaps, conjuring up a vision of being able, without capital, to set up in business for himself, and the second asking himself the question whether all the valuable plant in which he has sunk so much money is to become antiquated and out of date.

The announcement to which we refer was, as we stated last week, made at the Camera Club Conference by Mr. Sutton, who explained the method by which he worked. Briefly stated, it is as follows:—A negative image is obtained by exposing to light an ordinary gelatine plate beneath a positive, together with a lined screen, such as is used for the Meisenbach and other processes, with the obvious result that the surface of the negative so produced is cut up into dots innumerable. The negative is fixed in strong hypo, so that the operation shall be rapid, and is afterwards washed as quickly as possible, the object of haste in both cases being that the gelatine surface shall not absorb too great a quantity of water.

Now comes the novel part of the process. After the washing operations, the negative is made surface dry by pressing on an absorbent surface, such as a linen pad or sheet of blotting-paper, and is then gently heated. The action of the heat is soon evident, in raising into relief those parts which have been affected by light—*i.e.*, the blackened portions of the film—leaving the dots as depressions. After the plate is dried, its gelatine surface is brushed over with fine graphite or plumbago, to give it a conducting surface, and it is submitted to the electrotyping process by being placed in a bath of cupric sulphate in the well-known manner. The result is that a thin skin of copper is attached to the surface, and this is afterwards built up with lead, and mounted type-high on a wooden block. Such a block is then ready for the printer.

Such is the theory, and it was so far borne out by practice that Mr. Sutton was able to exhibit to the members of the Camera Club a couple of blocks produced by the process.

Immediately on the publication of Mr. Sutton's paper, we determined to test the process for ourselves, for we were willing to acknowledge that, if practicable, it would cause quite a revolution in the means at present available of getting printing blocks from photographs. But instead of following exactly Mr. Sutton's steps, we determined to try whether the production of line drawings and engravings, now commonly done by the zinc etching method, could not be brought about by the new process, for what should be good for dots ought to answer equally well for line subjects. Moreover, by adopting this class of work we at once dispensed with the line screen, and there is a natural temptation in working experimentally to simplify matters as much as possible.

We commenced operations by making a small negative of one of Hogarth's engravings, and we chose the subject principally because its lines were distinct and bold, and also because, in the event of publication of the experimental block, no question of infringement of copyright could arise. This negative was developed with pyro and soda, for we knew by experience that a certain make of plate developed by this formula would stand a very considerable amount of heat without any melting of the gelatine. The negative was fixed, and washed for ten minutes only; but during this period the full force of the water-tap was turned on to it, so that the washing, although occupying a short time, was thorough in quality.

This being done, the negative was pressed between blotting-paper so as to take off adherent water, and immediately held in a metal dish at some distance above a Bunsen burner, the dish being moved about so that it should get uniformly heated. The effect on the plate was almost immediate. It began to steam, and the exposed parts swelled up into high relief, just as we had experienced many a time and oft when necessity had caused us to dry a similar plate rapidly so that it might be quickly printed from. When the maximum effect was reached, we left the plate in its dish on the ring of a retort stand placed some fifteen inches above the burner, and it was quite dry in about twelve minutes. The relief still remained apparent, but we judged it to have been reduced in height more than one-half. So far, the experiment was successful, and in case of accident we repeated it with two more plates with equal success. But we should mention that with another brand of plate we came altogether to grief, the film contracting and leaving the glass bare all round the edges directly heat was applied.

Two of the successful plates were now placed in the hands of a skilful professional electrotyper to be covered with the copper deposit, one by a dynamo machine and the other by battery. We are sorry to say that the result was the reverse of successful in both cases. The copper, in both plates, left bare places in the gelatine, so that the copper shell, instead of being perfect, was full of holes. Whether Mr. Sutton adopts some means of hardening the gelatine, or in some other way protects it from the destructive action of the copper bath, we do not know; but our experiments show that the process is not devoid of difficulties. In a subsequent article we shall point out some modifications in the manipulations by which we think more successful results may be achieved.

## THE "SIR PAUL PINDAR."

This cut is from a photograph of the old house standing until lately in Bishopsgate Street, and which has now been

re-erected in the South Kensington Museum as a specimen of Old London architecture. It is an interesting memorial of the time when merchants used to live in the city, and not in the suburbs. The disappearance of this old landmark, which dates from the time of James I., was referred to in our issue of the 3rd instant.

## FURTHER NOTES ON ELECTRO-CHEMICAL REVERSALS WITH THIO-CARBAMIDES.

BY COLONEL J. WATERHOUSE S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

As a postscript to my last paper on this subject, published in the Photographic News, it was stated that an experiment with a pair of silver plates coated with precipitated silver bromide, of which one had been exposed to light and the other not, when connected with a very sensitive galvanometer and immersed in a plain eikonogen-lithia developer, showed a distinct electrical current, the needle deflecting towards the left; but when a pair of similar plates were immersed in the same way in some of the same developer containing five drops per ounce of Professor Reynolds' compound salt of thio-carbamide and ammonium bromide, the current was reversed and the needle deflected to the right. It was found that with the ordinary developer the exposed plate formed the negative pole of the galvanic couple, and produces a negative photographic image, while with the thio-carbamide developer it becomes the positive pole, and produces a positive photographic image. This reversal of the current has since been successfully repeated with the same kind of plates and developer, and also with a developer containing thiosinamine.

Silver plates bromised by immersion in bromine water have also shown the reversal of current clearly, and I have been able to obtain it on ordinary gelatine dry plates, though in this case the currents are exceedingly weak. There is, therefore, practically little doubt of the fact of the reversal taking place.

With silver plates it was found that the observations were rendered rather uncertain by reason of the comparatively strong currents caused by polarisation, especially after the plates had been used a few times, being cleaned merely by a good rubbing with emery powder and polishing, and therefore more or less impure on the surface. They can, however, be rendered pure by heating to a red heat, and quenching in dilute sulphuric acid. It is desirable to always perform this operation before using the plates.

Experiment having shown that it was possible to obtain evidence with the galvanometer of electrical action between the exposed and unexposed halves of a gelatine dry plate during development with ferrous oxalate, various methods of rendering gelatine dry plates sufficiently conductive to show the currents formed during development were then tried. Among the substances used were:—1. Gilt plumbago, which did not answer very well. 2. Silver bronze powder, which is generally a very good conductor, but did not answer at all in this case; the current from a battery would not pass. 3. Reduced silver in very fine powder, as deposited from mirror silvering solutions; this is an admirable conductor for ordinary electrotyping purposes, and also answered well in this case when applied wet, and polished after drying so as to give a bright and fairly solid coating. 4. Silver leaf; this answered well, but not quite so well as gold leaf.

The gold leaf seems, perhaps, the best material to use, because the gold conducts the current without exercising any chemical action with the developer, which might of itself cause currents. It is not so readily attacked by the sulphur set free at the negative pole as silver is, though some action probably does take place.

Either gold or silver leaf can quite easily be applied to the plates. The following method is effective.

Take a piece of stout blotting paper rather larger than the sheet of gold leaf; moisten it slightly, so as to leave it evenly moist without being wet, and lay it down carefully over the gold leaf, smoothing it lightly into contact all over. Then lift up the paper, to which the gold leaf will attach itself. The sheet can then be cut into convenient sizes, and the pieces applied to the gelatine surface of the dry plates. A piece of hard, dry paper is laid over the blotting paper and well rubbed down with the finger. The blotting paper will then be found to come away quite easily, leaving the gold leaf attached to the plate.

Another method, which answers very well, is to coat the glass slips with a thin substratum of gelatine and chrome alum; when dry, the gold leaf is applied as above. Strips of sensitive gelatine film, which, in the case of Wratten's "Ordinary" plates, may easily be stripped from the original glasses, can then be transferred to wet blotting-paper and laid down over the gold leaf, much in the same way as the gold leaf. This method has the advantage that the gold leaf is not in contact with the developer, and the currents seem to pass quite as easily as when it is outside the gelatine films.

The dry plates used were Wratten's "Ordinary," in slips about 4 inches long and $1\frac{1}{4}$ inches wide, the same as the silver plates. The gelatine offers a considerable resistance to the electrical current. A current from a bichromate cell, which, when passed through a pair of bromised silver plates in eikonogen developer, will mark a deflection of between 80° and 90° with the tangent galvanometer, when passed through a pair of gelatine dry plates faced with gold leaf and immersed in the same developer, will mark only 40° to 50°. Consequently, the currents produced by the action of developers with or without thio-carbamides on exposed and unexposed dry plates are exceedingly weak, and only just perceptible with the very sensitive suspension galvanometer. With silver plates coated with silver bromide the currents are very much stronger; but, as stated above, the results are somewhat uncertain, owing to polarisation currents. In all cases the currents produced with the thio-carbamide developers are stronger than those produced with the plain developer.

It is not yet quite clear how this reversal of current is produced, but some observations by T. Skey, recorded in vol. xxiii. of the *Chemical News*, throw a good deal of light on the matter. He found that metallic sulphides which have the power of conducting are also capable of generating electricity; and from a list he gives of the relative polarity of different sulphides, it appears that silver sulphide is positive to silver. In a battery consisting of a sulphide and a metal in acidulated water, the gas liberated is sulphuretted hydrogen, the nascent hydrogen exerting a de-sulphurising action upon the metallic sulphide, the ultimate effect of which is, in some cases, to completely reduce the mineral to the metallic state.

This seems to bear out the observation, recorded in my first paper, of the *reducing* effect of the thio-carbamides in alkaline solution on silver haloids.

Skey also states that sulphides are capable of performing the function of the negative element of a galvanic couple.

We have seen that the galvanometer shows that, with the ordinary developer, the exposed parts of a sensitive surface of silver bromide form the negative pole of a galvanic couple; and, consequently, by the laws of electrolysis, they attract the deposit of reduced silver, the alkali metal, and the hydrogen, whilst the liberated bromine or other acid, radical elements, and the hydroxyl of the base go to the unexposed parts forming the positive pole.

On the other hand, with the thio-carbamide developers silver sulphide is formed by the action of the developer on the unexposed parts of the picture, which then become the negative pole instead of the positive, and attract the sulphur, the hydrogen, the alkali-metal, and some of the deposited silver formed by the action of the developer on the exposed parts of the plate, which now become the positive pole, and attract the bromine and the hydroxyl; the former combining with some of the remaining deposited silver to form silver bromide, which is dissolved out by the fixing solution, leaving more or less residue of reduced silver.

There can be little doubt, I think, that, roughly stated, this is probably the correct theory of the reversals, though much remains to be done in working it out fully in order to throw more light on the various reactions which take place. A further investigation might result in finding some method of making the photographic reversals more perfect, and it seems likely that an electrolytic examination of various developing agents would afford valuable information on the general theory of development. The currents produced are, however, so weak that their satisfactory observation would be a matter of some difficulty. The subject is one of which I have very little knowledge, but it is to be hoped that the investigation may be taken up by some one more competent to deal with it.

## TECHNICAL SCHOOLS FOR PHOTOGRAPHY.

BY MAX JAFFE.

[In view of the proposed Institute, the following article, sent to us by the courtesy of the distinguished author, and translated for the PHOTOGRAPHIC NEWS, will, we feel sure, be interesting to our readers.—ED.]

It is impossible that the manifold changes which, during recent years, have sprung into being in all trades, as much in technical matters as in commerce, could remain without influence on the relation of tradesmen to their apprentices. The many innovations which are constantly introduced, the increased, overpowering competition, which compels him to strive continually after the improvement and simplification of methods of working, added to many other things which would take too long to enumerate, rob the tradesman of so much time now-a-days that he can no longer, as was formerly the case, take part, in a thorough manner, in the supervision of his workshop; and, therefore, cannot bestow the necessary care upon the apprentices committed to his charge. Nor can he teach and improve them to that degree to which they were educated in former times. Any law for giving directions to the employer regarding the instruction of his pupils would avail little; only a total reformation of our modern methods of instruction would be of the slightest use; and that no reasonable person would be likely to expect. Consequently, a danger exists that, if no other remedy be created, the industrial arts, instead of still going forward, will suffer a relapse. Certainly there are frequently workmen to be met with who have attained a complete mastery of their trade, and thus reached prosperity; and the existence of a rare degree of cultivation, added to an equally rare degree of perseverance, which overcomes all obstacles, is occasionally to be found. Such exceptions must be considered in calculating the danger of a relapse in the progress of art industries.

Those who have no opportunity in their youth of acquiring proficiency in their particular trade or profession, and are compelled to work in order to live, can never hope to be able to execute any but purely mechanical work.

These facts have been long known, and have led to the creation of public institutions for trade education. They are seen to multiply in almost every civilised community, the Government going hand-in-hand with the principal representatives of certain industries in the founding and furthering of these technical schools.

If it is looked upon as a great benefit that technical schools exist in which a man can learn the trade to which he wishes to devote himself, on the other hand, it is not to be doubted that this privilege can only be valuable where the instruction is absolutely thorough.

Our high schools are organised on the pattern which the philosophical and clerical schools of ancient times, and, later, the monastical schools, furnished; and an abundance of intellectual culture goes forth from them yearly, benefiting and brightening the whole civilised community.

Where is the pattern of a technical school to be found? In the fact that capable workmen were formerly rendered efficient during their apprenticeship. It is only right, and corresponding to the knowledge-acquiring spirit of our times, that the particular branch of science on which an industry depends should be taught in the technical schools. One point, however, is quite clear, and that is that knowledge is not the purpose, but the means to an end, and that the principal necessity in a thorough education is technical proficiency. Hence it is proved that, as only the most highly intellectual men should be chosen as instructors in the high schools, only the most efficient representatives of an industry should be selected in the technical schools; only, that is, such men as have attained a thorough knowledge and complete mastery of their trade through actual experience.

It must be remembered that apprenticeship does for the pupil, in one respect, what even the best organised technical school cannot compete with; that is, the direct acquaintance with practical life and its claims. The scholar who has just left school, till then led continually by his teacher, is absolutely ignorant of practical life—another reason, surely, for being the more anxious for his technical education.

In what manner is this result to be arrived at in the profession of photography? Before we answer this question, it appears advisable to point out the position which our profession occupies, more especially as there has been such an enormous extension of it since the introduction of gelatine dry plates that its limits are absolutely indefinable; so that some people, otherwise intellectual, will not acknowledge the existence of a photographic profession at all.

It is not to be denied that grand things have been done by amateurs both in landscape and portraiture, but there is every justification for the existence of professional establishments, both in the present and in the far distant future. The energies of the photographic profession will be more and more directed to the application of photography to science, art, and industry; principally by the constantly improving photo-mechanical processes which bring photography in contact with the printing-press.

Our profession, like all others which find their foundation in art, is an art industry. On the other hand, it is continually dependent upon the results of scientific researches, and, in this respect, comparable to electrical industries. The photographer is just as little a scientist as the electrician, and just as little an artist as the art furnisher and art decorator, and his endeavour should be this: to be a thorough professional man whose knowledge is ennobled and inspirited by a scientific and artistic education. To obtain this result, special care must be taken in the foundation and organisation of technical photographic schools, to provide a thorough preparatory education in artistic and scientific respects. The next thing to be considered is the teaching of drawing. The exercises must be adjusted, on the one hand, to the preparatory knowledge which the pupil has already acquired, and, on the other hand, to his natural talents and the special branch of the educational course to which he intends to devote himself. It must be taken into consideration by all who go in for photography as a profession, that drawing is a particular necessity, for the formation of the taste in general, and principally, the appreciation of form, contour, and perspective, plane and solid. The drawing lessons should occupy the pupil the whole day, and he should study from the antique, the nude, drapery, &c., landscape, and every form of ornament. We consider art history an indispensable item; the pupil should be instructed so far that he shall be well versed in the development of the artistic life of all nations and ages, and in the characteristics of the various schools. These drawing lessons should be continued during at least a year for every student, and for such pupils as desire to learn retouching and painting of photographs, not less than two years. For these latter a course of anatomy should be provided. Besides this, all those who wish to learn the various photo-printing processes should have opportunity provided for them of practising on papers prepared and unprepared, as well as work on the lithographic stone.

(*To be continued.*)

Newcastle-on-Tyne and Northern Counties Photographic Association.—The next meeting of the above Association will be held in the Mosley Street Café, Newcastle, on Tuesday, 21st April, when a paper and demonstration on carbon printing will be given by Mr. T. Hedley Robinson.

Theory of the Phenomena of Dyeing.—All the phenomena of dyeing necessitate two essential conditions: the presence of acid or basic functions in the material to be dyed; the presence of the same functions in the colouring matters. The sole exception of this rule is that of the tetrazo colouring matters, which are taken up by cotton without a mordant, in an alkaline bath, and which will require a special study. We are entitled to say that the phenomena of dyeing, obtained with soluble colouring matters, are of a purely chemical order, and that the rules of chemical action are sufficient for their explanation. Léo Vignon.—*Chemical News.*

Transfer of a Photo from Chromate Paper to Zinc.—Place the chromate paper containing the photo for ten minutes between two sheets of paper which have been saturated in a 1-5 solution of nitric acid in water. Upon the zinc plate place a piece of paper which had been previously soaked in nitric acid, and pull through the hand-press, which will cause a slight etching of the surface of the zinc plate; the sheet of paper is taken off, and all traces of nitrate of zinc are carefully removed from the zinc plate by means of a blotter. The photo is then transferred upon the plate, gummed over, &c.; it is then rubbed in with ink, which has to be thinned with olive oil, and when all details appear sufficiently strong the plate is etched with a preparation made by adding a small quantity of phosphoric acid to a gum solution. When a drop of such a preparation placed upon a polished zinc plate discolours the same and effects its purity, then it is of sufficient strength.—*Lithographic Art Journal.*

## THE ETHER LIGHT.

So many questions are asked by photographers and lanternists with regard to the efficiency of ether as a substitute for the usual house gas in limelight work, that the following remarks upon the subject will prove interesting. They were originally contained in a private note addressed to the Editor from a German correspondent, and permission has since been obtained to publish the matter in the Photographic News.

I promised some time back to give you an account of my experiments with the ether light. It is about ten years ago that I began with lantern projections, which soon became my hobby, and have been ever since. I began with a "wonder" camera, which soon was followed by a pair of home-made, clumsy, wooden lanterns, but with good optical parts. If I remember well, it was in 1884 that I exchanged these giants for two sciopticons, with Newton's three-wick refulgent lamps. In 1886 I adopted the limelight. Luckily circumstances brought me into possession of a polariscope (after the design of Prof. Paalzow, of Berlin), and from that moment the ordinary blow-through jet did not do any longer. I was in search of more light. My gas jets were interchangeable ones, allowing their use as spirit jet, safety jet, or mixed jet. I must point out that the oxygen outlet was not *round*, but *flat, somewhat* like a slit of four millimetres in length and half mm. in width. These jets give a powerful light.

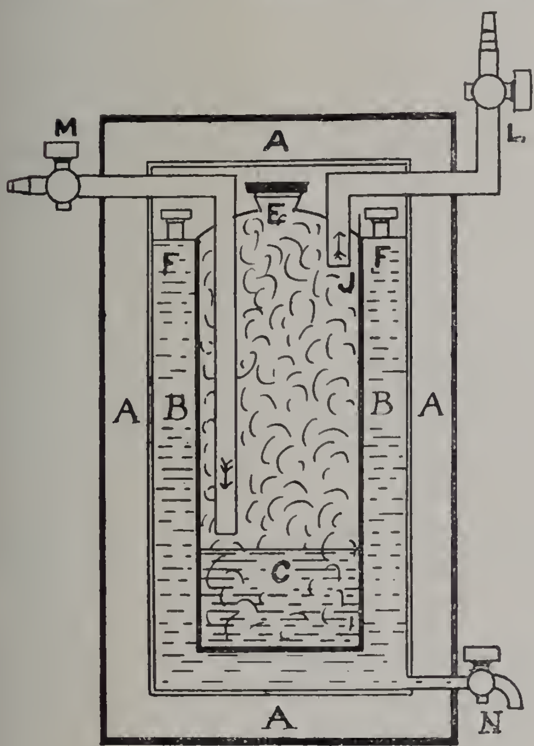



Fig. 1.—Gasoline Tank for Limelight.

Now the mixed jets' turn began, after I had convinced myself that there was no doing with the blow-through. Two bags were used, and everything went on smoothly; but I disliked the trouble of having to do with two bags. I remember having read in Liesegang's *Laterna Magica* (a quarterly paper), and also in his book, "The Projecting Art," of some gasoline light, and a Herr Fr. Jul. von Kalkow was mentioned as the inventor. I had such an apparatus made for me, and give you here a drawing of it, which will better explain than describing it at full length. The whole is made out of zinc (see fig. 1). A and B are cylindrical vessels, one within the other, but with a space between each. A is occupied by stuffing of wool; B contains hot water filled in from F, and, after use, let out by N. The inner cylinder, C, is stuffed with curled horse-hair, and, by unscrewing E, gasoline or ether can be poured into it as far as the mark at C, so as to keep the level of the liquid to the opening of the H tube. The vapour is emitted at J to the tap L, from whence a tube carries it onwards to the H jet.

Now, Herr von Kalkow blew ordinary air through this apparatus, filling a second bag with the so saturated air. Having, however, read that blowing pure oxygen through it was more advantageous, I took at once to this method. The result was a much superior light.

It was in the beginning of 1887 that I adopted this method, but Herr von Kalkow constructed his apparatus long before that time, and the first description given is in No. 6 of April, 1878, of Liesegang's *Laterna Magica*. In No. 27 of the same paper of July, 1885, I found a description of the Broughton tank. I had one made, for economy's sake, out of tin. Its performance, however, did not please me. I had several pops with it, and I took again to my first saturator. One day the following idea struck me. I took my Broughton tank to pieces, and

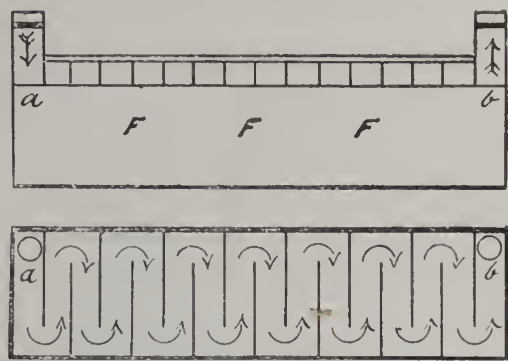



Fig. 2.—Modified Broughton Tank.

had all the partitions forming the circuit cut short to about one-third of an inch. I further did away with the chambers on the top, and in fig. 2 is shown, both in section and plan, the form of instrument I got.

Into the empty space below (FFF) I put layers of coarse flannel and thick felt (such as is used under saddles) till the box was full, then I *pressed* the lid with the circuit on to it, and had it soldered tight down—the flannels and felt pressed together, and the zig-zag canal kept open. This modification made the saturator work very well, better than the one on von Kalkow's principle. I attribute the improvement to the greatly extended circuit, and the consequent better saturation of the oxygen. This alteration I made towards the end of 1887.

When the lantern season for 1888 began again, I found in an English catalogue an "ether saturator" recommended. Opening my own improved one, I found it all rusty inside. Instead of having a new one made like it in a more suitable metal, I decided to try the English one. I at once set to try this new one (manufactured by Sutton and Cutts), but it did not answer; but I am bound to say that the fault was not with the saturator, but with the jet, which, as I mentioned before, had a *flat* (slit-like) opening. So I at once ordered a pair of interchangeable jets suitable for the ether light. They arrived, and since that time the saturator, as well as the jets, have done their duty I never have a blow-up or a pop, and always get a very good light for polariscope and microscope.

I learnt subsequently that Mr. Ives has also taken to the zig-zag circuit, but, if I am well informed, not before the year 1888, whereas I had already, towards the end of 1887, made a canal of this form to my tank.

Ives's patent, I am told, dates from 1882, and his improvement for the zig-zag from 1888. Scott's saturators came out in 1890. If these dates are correct, neither of them can claim the priority of invention, either for the stuffed saturator or for the zig-zag canal on the one hand, nor for applying heat to the saturator on the other hand. Previous to them there was Herr von Kalkow, whose saturator was described in 1878, and I myself used a zig-zag canal as early as 1887 on the top of a layer of porous material.

I quote these dates as they may interest you, as I have no pecuniary interest in the matter at all.

If the ether light is not generally used, I think it is in consequence of its being associated with that ill-bearing name, "mixed jet." If so, help can be brought with very little loss of light. I have designed a *blow-through* jet which is well adapted for the ether light. This same jet gives also a most brilliant light when two bags are used. It stands somewhat between the usual blow-through and

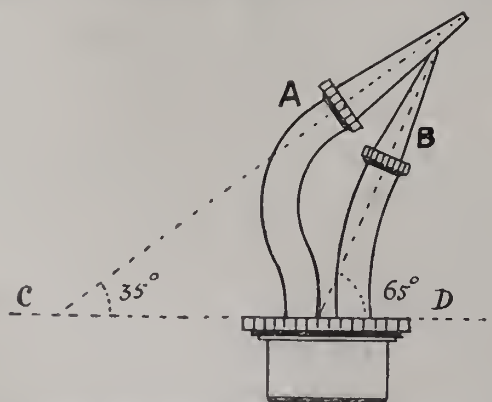



Fig. 3.—Blow-through Jet for the Ether Light.

the mixed jet, but *two* bags are necessary (see fig. 3). A and B are two ordinary nipples, of which A projects above B by about six millimetres (one-quarter inch). Both have equal bore of one millimetre (one-twenty-fourth of an inch). The A nipple makes an angle of 35°, and the B nipple one of 65° with the horizontal CD. From the point where the B nipple touches the A nipple, a small groove is worked into the under part of the A nipple, reaching to the point of the burner. I think it would be worth your while to have such a jet made, so that you could for yourself form an opinion of its merits. This form of jet is very advantageous for those demonstrators who would like a better light than is obtainable with the ordinary blow-through, and yet would not like to use a mixed jet.

With *one* bag for the oxygen and the gas from the main supply the jet *is not suitable*, but when two bags are used with a weight of one and a half hundredweight to begin with, the jet gives a light very near to that by the ordinary mixed jet. I should very much like to see such a jet worked with two cylinders, of which, as yet, I have no experience.

With the ether the jet is safer than the mixed jet, because the vapour and the oxygen are kept separate till the igniting point is reached, and another advantage is that the peculiar construction causes the hydrogen element to heat the oxygen nipple, and the heated oxygen increases the intensity of the light.

## CRYSTAL PALACE INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

### First Notice.

This Exhibition, which nominally opened on Monday last, was, after the manner of exhibitions, not nearly ready for public inspection on the opening day. Some of the apparatus stalls were unoccupied, while at others the tapping of hammers and screeching of planes told of fixtures not yet in a fixed position.

So far as the apparatus section is concerned, the present Exhibition bears unfavourable comparison with that of two years ago, when from one end of the nave to the other the floor of the building was covered with the exhibits of our foremost manufacturers. This year about one-sixth of the same space is occupied with apparatus, and, although one or two leading firms put in an appearance, the majority are conspicuous by their absence. A visitor to the Exhibition held here in 1888 or 1889, and who afterwards came to that of 1891, might think that, perhaps, the trade had combined to boycot the scheme; but such is not the case. It is a simple matter of that consideration of the three letters, £ s. d., towards which most things human have to filter down. In a word, the manufacturers say that it does not pay them to exhibit at Sydenham; if it did, they would, of course, go there. But when goods have to be carried to and fro, an assistant taken from his ordinary work to be on duty at the Palace each day, and rent for space paid, there is little or no margin left for profit on any business which may be done. The Crystal Palace authorities would do well to look the matter fairly in the face, and see whether they cannot another year offer better inducements to our leading firms to exhibit their goods. To many people the apparatus is more attractive than the pictures, and they go to an exhibition like this principally to see what novelties there may be in the market. Visitors to Sydenham this year who have such proclivities will most certainly be disappointed; but it is as well to remember the salutary adage, "*Audi alteram partem*," and the other side say that if exhibitors would rent smaller spaces, and would take good care to put them in charge of pushing assistants, they would have no reason to regret their outlay.

But although the apparatus is not as plentiful as one could wish, we may certainly say that never has a better collection of photographs been seen at the Crystal Palace; and we are able to say this at a time when many of the pictures expected are not yet in their places; for, by an unfortunate misunderstanding, some two hundred pictures are detained at Liverpool. The date of the Palace Exhibition was so fixed that its opening should just tread on the heels of the closing day at the Liverpool Exhibition, so that many of the pictures shown at the latter place could be packed and sent to Sydenham direct. But this wise arrangement was suddenly knocked on the head by the resolve of the Liverpool people to keep the doors of their successful Exhibition open for an extra week. This will at once account for the many blank screens and alcoves on view at the Crystal Palace last Monday, and for the notification which adorned them, to the effect that several important exhibits would not be in position until Friday (to-day).

This unfortunate *contretemps* has, too, caused the judges, of necessity, to hold their awards until they could pass sentence on the Exhibition as a whole. It will, therefore, be better if we, too, reserve all notice of the pictures until our next issue; but we can most certainly hold out the promise that the collection will be one of very great interest to everyone of photographic tastes.

As usual, the lantern entertainments in the large theatre are rightly relied upon as a most attractive feature of the Exhibition, and the opening show on Monday was most satisfactory in every way. Mr. S. G. B. Wollaston is single-handed this year, and not only manages the Exhibition generally, but has personal charge of a fine double lantern built expressly for the building by Mr. Watson, of Holborn, the lenses being supplied by Messrs. Taylor, of Leicester. We may, therefore, take it for granted that the apparatus is of the best; but we did not before know that Mr. Wollaston was such a first-rate manipulator. No exhibitor can complain that his slides are not well focussed, or that the light by which they are shown is in any way faulty. If they do not show up as well as they expect, they may be quite certain that the fault lies in the pictures themselves, and not in the apparatus, or in the operator who works it so skilfully. The accompanying music by Mr. Weston, the assistant organist of the Palace, every bar of which is most cleverly adapted in character to the type of picture exhibited, is quite a treat in itself.

It is arranged that Mr. T. C. Hepworth is to act as demonstrator in the theatre every Monday, Wednesday, and Friday during the progress of the Exhibition. On the alternate evenings the more commercial aspect of lantern work will be exemplified by Messrs. Noakes, of Greenwich, with coloured pictures, dissolving views, effect slides, and items of a similar popular character.

## DETECTION AND DETERMINATION OF VERY SMALL PROPORTIONS OF ALUMINIUM IN CAST-IRON AND STEEL.

BY ADOLPHE CARNOT.

The author takes a rather large quantity of the metal—for instance, 10 grms.—and attacks it with hydrochloric acid in a platinum capsule. The use of glass or porcelain is avoided as much as possible, to prevent any accidental introduction of alumina from the apparatus.

When the metal is entirely dissolved, without allowing the solution to become peroxidised by exposure to the air, it is diluted with distilled water and put into a flask or a beaker, washing it several times by decantation, and retaining the insoluble portion—graphite, silica, &c.—upon a filter. A portion of silica may remain in solution, and must be eliminated afterwards; but this must not be done by evaporating the solution to dryness, as it contains an enormous quantity of ferrous salt.

The greater part of the free acid is neutralised with ammonia and then with sodium carbonate, and sodium thiosulphate is added. When the violet colouration has entirely disappeared, and no more ferric salt in the solution, which is now completely colourless, he adds 2 or 3 c.c. of a saturated solution of sodium phosphate, and about 20 c.c. of a solution of sodium acetate. The liquid is then heated and raised to a boil, which is kept up for about forty-five minutes, or as long as the slightest odour of sulphurous acid is perceived.

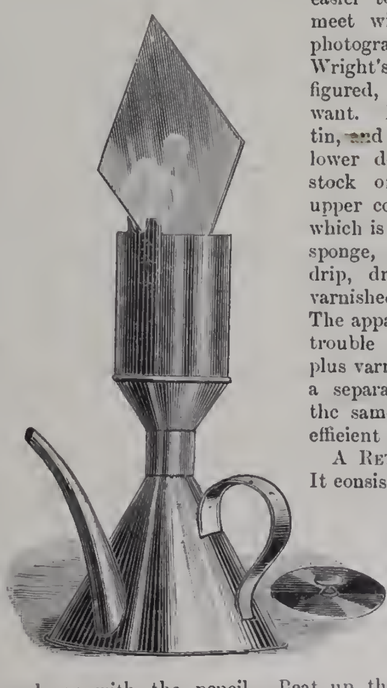
There is formed a precipitate, generally of little bulk, consisting of aluminium phosphate mixed with sulphur, and containing a little silica and ferric phosphate. This precipitate is received on a filter and washed with a little boiling water, and then placed on a capsule of platinum, and treated in heat with 10 or 15 c c. of hydrochloric acid diluted with water.

The solution is evaporated to dryness, and the residue is kept at 100° for an hour, so that the silica may become perfectly insoluble in acids. It is then re-dissolved in a little dilute hydrochloric acid, heat being applied to re-dissolve all the aluminium and iron phosphate; the liquid is filtered to remove the last traces of silica, diluted with 100 c.c. of cold water, and the precipitation of the aluminium phosphate is repeated by the same method—that is, by almost complete neutralisation of the acid with sodium carbonate, the addition of thiosulphate in the cold, and subsequently of a mixture (previously dissolved) of 2 grms. acetate and 2 grms. thiosulphate, boiling for half-an-hour, and filtration through a small filter of paper which has been washed with acids and leaves no ash.

The silica and the small quantity of iron which remained in the first precipitate have thus been completely eliminated from the second, which, after having been washed with boiling water, is dried, ignited, and weighed.

The aluminium phosphate thus obtained ($PO_5Al_2O_3$) contains 22·45 per cent. of aluminium. The operation requires only a few hours, and gives accurate results.—*Bull. de la Soc. Chim. de Paris.*

Handy Varnish Pot.—Any appliance which will make the extremely disagreeable and tedious operation of varnishing easier to the operator should meet with a welcome from photographers. Mr. W. E. Wright's apparatus, here figured, seems to meet a want. It is constructed of tin, and is in two parts, the lower destined to hold the stock of varnish, and the upper containing a funnel in which is placed a plug of fine sponge, through which the drip, drip from a freshly varnished plate can filter. The apparatus thus saves the trouble of running the surplus varnish from a plate into a separate bottle, while, at the same time, it acts as an efficient filter.



A Retouching Medium.—It consists of the white of an egg, with a little ammonia added to preserve the albumen from decomposition, and the inventor says it supplies a fine biting surface to work on with the pencil. Beat up the white of one egg to a froth; let it settle. Then add ten ounces of distilled water, shake up, filter, and add a few drops of ammonia. After the negative is washed, flow it with the albumen solution, and let it dry. Unlike many of the concoctions sold, it is harmless.—*Photo. Record.*

## Notes.

Our readers are requested to note that, as announced in the last issue of the Photographic News, the price of the paper is now reduced to twopence.

More work for the photographic process-block maker. The prospectus of a new magazine, *The Ludgate Monthly*, has been issued, and, judging from its specimen pages, the publication should "catch on," as they say over the water. The illustrations are well done, some being from tint drawings, and others owing their being to the zinco-line process.

It would be an interesting thing to know how many of these constantly cropping up new publications owe their inception to photography. Some of them, of course, could never have been launched at all unless some method of producing pictures without the aid of the slow cutting graver had been devised. The *Daily Graphic* is an example of one. Certain it is, too, that the army of second-rate comic papers (so called) could never have been possible without the aid of the photographer.

The World's Fair at Chicago is, according to a prospectus which we have received, to lick all creation. The *American Scribe*, in dealing of its wonders, breaks forth into poetry, as the following extract will show: "North of these buildings, in the main lagoon, will be an island of twenty or thirty acres in area. It is the intention to have this kept as wild and primitive as possible. There the visitor may wander through a miniature 'forest primeval,' pathless and untransformed by art, and may hunt the fragrant wild flower, or the *saucy chipmunk*, and generally commune with nature in its native haunts."

One expression we have emphasised by italics, for, although we have referred to every dictionary within reach, we have not found out what it means. A friend suggests that *saucy chipmunk* is American for amateur photographer. If this be so, we cannot see why he should be hunted; but then, in this country, we do not hunt "fragrant wild flowers." They are curious people, these Americans.

All who have made a study of the human countenance —a category which should, of necessity, include photographers—must have noticed that, in spite of the common notion that nature is diverse in her works, and seldom repeats herself, some human beings so closely resemble others of their species that one is almost persuaded to believe that every man has his double. That this is hardly an exaggeration is proved by what most of us have experienced, the addressing of an utter stranger in the street in mistake for an intimate acquaintance, and only finding out the error when confronted by the cold, disdainful stare of the insulted one.

Toole, the actor, it is said, once turned such an accident into a practical joke of a very humorous kind—humorous, that is, except from the victim's point of view. In a certain restaurant he had, in error, clapped a stranger on the back and exclaimed, "Halloa! George, how are you?" Apologies followed, and all was well so far. But Toole presently pointed out the victim to a friend of his who sauntered in, and, without referring to what had occurred, said, "I bet you a shilling that you won't go up to that old chap in the corner, as if you knew him, slap him on the back, and say, 'Halloa! George, how are you?'" The friend took the bet, and carried out its provisions to the letter, with a result that can be better imagined than described.

Two well-known men, who have recently gone over to the majority, had well-known doubles. One, the late Lord Granville, was exactly like Mr. Denny, of the Savoy Theatre, when made up for the Grand Inquisitor in "The Gondoliers"; and the other was the late P. T. Barnum, the great American showman, who was, in feature, the exact counterpart of Titus Vespasian, according to a certain Neapolitan sculpture, a cast of which stands in the Crystal Palace hard by the Egyptian Court.

The hackneyed phrase, "There is nothing new under the sun," has a peculiar suitability when applied to photography. Investigators and experimenters who stumble upon what they think is a novelty are continually being pulled up by some tiresome person with a good memory, who calmly says the same thing was done a quarter of a century or so ago. A case in point occurred at a recent meeting of the Royal Microscopical Society, in connection with a suggestion of M. Fayel as to a novel method of examining large opaque objects, which he terms "Photo-micrography in space." The plan proposed by M. Fayel is to direct a photographic lens to the object, and focus the image upon the ground glass of the camera. The ground glass is then removed, and the aerial image viewed with a compound microscope. No sooner was this method brought under the notice of the Society than Dr. Charters-White remembered a similar plan devised by the late Dr. J. Matthews for precisely the same purpose, and described and exhibited at the Quekett Club in February, 1879, under the name of the micromegascope. This brought up Mr. Mayall, who pointed out that the micromegascopé was known in the last century as the "megalascope," and was constructed by B. Martin. If the subject could have been pursued, it might have been discovered that Martin had borrowed the idea from somebody else. However, so far as is known at present, the honours rest with the "megalascope."

A proof of the widespread interest taken in photography is the frequency with which articles appear in periodicals intended for that omniverous person, the general reader. In Scotland they have

WAITING FOR WIND.

gone a step further, and the *Weekly Scotsman* now devotes a special column every week to the subject. We learn from this column that arrangements are being made for the establishment in Liberton, near Edinburgh, of a photographic society for amateurs. Soon, no town—one might almost write village—will be complete without its photographic society. Certainly, there is no subject so provocative of talk as photography, and yet the Photographic Society of Great Britain complains, or did complain, that it cannot get topics and papers for discussion.

---

Hitherto the opportunities for making cloud negatives which April usually affords have not been so frequent as the ardent amateur would like. Watching for the sun while a bitter north-east wind is blowing is not very pleasant work, though the amateur of the old school was indifferent to bodily discomfort. Carrying half a hundredweight of photographic baggage was probably good training. Whether the amateur of to-day, who likes everything ready-made for him, has the courage to risk a cold in the head in securing cloud pictures, is not quite so certain; anyway, if he does take out his camera for this purpose, and is successful, it is to be hoped that his results, when joined to landscape negatives, will not show the sun shining at the same time from opposite sides of the picture. It is all very well for him to improve an expanse of vacancy by putting in clouds, but, to use an expressive theatrical phrase, let him also "jine his flats."

---

Mr. Robert Buchanan, in his vigorous attack on the Zola and Ibsen school, is not very complimentary to photography. He compares the "present apotheosis" of dreary dramas to "a series of dingy, amateur photographs taken in the scullery during sunless weather," and he holds, in pursuing the comparison, that "there is even more falsehood to nature in a bad photograph than in a wildly executed painting." What have the believers in naturalistic, out-of-focus photography to say about this?

---

The death of Keeley Halswell removes from our midst a painter who, of late years, had made the upper waters of the Thames his constant study. He had his studio in his house-boat, and here he worked at those delightful sketches of river scenery which are identified with his name. Mr. Keeley Halswell, like Mr. Wyllie, studied river life and aspects and their constant variety in the only way possible—by living on the spot. Their successes suggest what an enormous field the Thames presents to the photographer who has the perseverance to grapple with the subject in its entirety. Plenty of photographs of the Thames exist, it is true, but if they could be all got together, the result would only be a very disjointed collection.

---

The latest application of photography to medical science is to use it as a means of locating tumours on the brain. The theory is, that spasms are caused by affections of the nervous centres, and that the disturbance of a centre is invariably followed by identically similar contortions of the muscles. A tumour must, of necessity, press upon a nerve centre, producing violent spasmodic attacks. While in this condition the patient is photographed, and the exact position of the tumour discovered. Experiments, says the *Mining and Scientific Press*, of San Francisco, have been successfully made by an "eminent local surgeon." We must confess we do not follow the reasoning which attributes spasmodic attacks to tumours on the brain. Why not to a tumour on any other part of the body? We should also like to know if one photograph will suffice, or if a series is necessary. There seems to be something wanting in the explanation of the theory.

---

The *Chicago Inland Printer* gives in its March number a reproduction of a photograph entitled, "An Old Love Maker," which visitors to the Pall Mall Exhibition of 1889 will possibly remember. The name of the company working the process is prominently displayed; the name of the photographer, Mr. H. P. Robinson, is omitted. The producers of other pictures given in the same number are treated with similar indifference. The only instance in which the photographer's name is mentioned is that of a photograph of a bridge at Berne, Switzerland; but then the photographer is a Chicago man, which, of course, makes a difference. American notions of copyright obligations are very elastic.

---

No fresh light upon the Pennell-Herkomer matter has been thrown by Messrs. Novello, the publishers of Mr. Herkomer's "Idyll," in their answer to Mr. Pennell. Messrs. Novello simply state their belief that the illustrations are all that is claimed from them. But this is precisely what Mr. Pennell wants to find out. He would like to know if the illustrations are etchings executed by Mr. Herkomer himself, or are photographic reproductions touched up with a needle, and this is what neither Mr. Herkomer nor Messrs. Novello will tell him. Possibly this withholding of information accounts for the flavour of acerbity regarding photography which marked Mr. Pennell's paper read at the Camera Club Conference.

---

Missionaries, like other people, have to move with the times. When Mrs. Jellaby flourished, flannel petticoats and pocket handkerchiefs were the articles of which it was considered the dark races stood most in need. We have got past these primitive ideas. A gentleman interested in the Blantyre Mission, South Africa, is of opinion that with the close of the lantern season there should be a good many photographic slides of "no further use" to their owners. He announces accordingly in a provincial paper that he will be very glad to receive contributions of such cast-off articles for the use of missionaries!

## THE PORTRAITURE OF THE UNSEEN.*

BY JAMES MEW.

A photo-microscopic album would be a novel and possibly pleasing variety for the jaded caller i' the afternoon, who is sick unto death of the feeble, fatuous family photographed groups, which have so often met her loathing eye. Such an album might be easily prepared. The common favourites shown by a magic lantern at a school treat could be without any trouble transferred to its pages. It might, for instance, contain the epidermis of the larva of a caterpillar (*tipula*), the tongue of a fly, the leg of a flea, the wing of a midge, the parasite of an ox, the *palpi* of a spider; and, if all these were not enough, specimens might be added of *orthoptera*, *dermaptera*, *hymenoptera*, *aphaniptèra*, *diptera*, *neuroptera*, *trichoptera*, *lepidoptera*, *homoptera*, and *heteroptera*, or, in common English, of cockroaches, earwigs, wasps, fleas, flies, dragonflies, caddisflies, butterflies, aphides, and bugs. Such a collection would add instruction to amusement. It might convey a religious as well as an æsthetic lesson. The exquisite marvel of divine workmanship in the oar-foot of the water boatman, or in the beak of the *cimex lectularius*, might be insisted on in the course of conversation, so long as the scientific names were preserved, without raising a blush in the peachbloom cheek of modest virginity, and with at least as much moral and religious benefit as the state of the weather, the behaviour of Mrs. Brown, or the difficulty of procuring a cook. But, if the above-mentioned album be not enough to divert conversation from these common and well-worn channels, other albums of a cognate interest could be conveniently produced.

Albums, for instance, of vegetable tissue containing leaves of the *deutzia*, raphides, and cuticles. Albums of crystallisations, showing the octahedrons or square prisms of strychnine, the oblique rhombic prisms of brucia, the regular white, brilliant cubes of arsenic, the acicular formations of caffeine, and the delicate profusion of silk-like spikes of quinine sulphate. Petrological albums displaying rock sections, thin slices of stone, to the representation of which the polariscope has lent its valuable opitulation.

Finally, if all these fail to interest, albums must be introduced of those minute organisms which seem to exist everywhere alike—in air and in earth, and in the waters above the firmament; in showers, and dews, and winds; in wells, and seas, and floods; in ice, and snow, and hail, and rain; in the waters under the earth, and in all green things upon the earth; whose name is legion; the vegetable pathogenic germs, whose paths are full of the crosses of destruction and decay; which destroy, but cannot, though living on life's lowest confines, themselves be easily destroyed, save, indeed, by a broth of their own immediate kindred—in a word, the *microbes*; albums of beings, of classification complex and variable, containing portraits of *Schizomycetes*, *spaltpilze* or fission-fungi, never fitly taken without photo-micrographic aid. In these albums, drawn by the powerful sun—like the fen-sucked fogs invoked by King Lear against his daughter Regan—or by the magnesium light, but, in either case, without bias and with unerring skill, the listless visitor may behold graphic presentments of creatures with which she has, at some time of her life, unless protected by particular favour of the gods, formed all too close an intimacy. Here are the *micrococci* with their circular presentments, the progenitors or clansmen of scarlet fever and small-pox, erysipelas, and pneumonia. Here are the stiff-necked *bacteria*, of whom Dr. Koch, of Berlin, first succeeded in photographing the *flagella* or tails; swift-moving, short, cylindrical. Here are their longer brethren, the *bacilli*, alas! too well known in hospitals of consumption, among them the *commabacillus*, whose portrait was first taken by Dr. van Ermengem in his etiology of cholera; albeit his claim to a relationship with that disease is not yet completely proven. And here are the curvilinear *spirillum*, reminding us of a corkscrew or the letter S, the quivering *vibrio*, and the *saccharomyces coprogenus* of Saccardo—better left concealed in the canonicals of lèarned obscurity.

All these and many more photo-micrographs may be exhibited at four o'clock tea, or any other festive occasion, nor do they seem altogether unsuited for the entertainment of what very good people will persist in calling the Sabbath. But, in a small chamber of this many-roomed palace of intellectual delight, there is one little picture upon which it were wiser not only not to speak, but not even to look. The dung fly's foot! The dung fly's foot, only too celebrated in photographic annals, is far better avoided. It disturbed the harmony of the past, and raised passions out of all proportion to its size. Let not its motto be "*Resurgam.*"

In conclusion, the careless spectator must not suppose that these portraits are taken with as little trouble as an ordinary human likeness. No! this tiny folk bristles with difficulties, which the photographer knows only too well. Consider, for example, the case of the familiar and, to some, insignificant flea, the human flea—for the race of fleas is large and varied—the beast known to the naturalist as *Pulex irritans*. His yellow colour constitutes at the outset a considerable stumbling block. He must meet with severe treatment in a solution of caustic potash; and yet not too severe, or he will dissolve into jelly. He must be soaked for a season in spirits of turpentine. His tissues must be bleached, and yet not too much, or they will become too transparent. The contents of his thorax and of his abdomen must be carefully expelled. He must be finally hardened with alcohol, and mounted in balsam. He must also be stained with many different stains to bring out his details, and all air-bubbles must be carefully eliminated from his likeness. The apparatus for taking him when suitably dressed varies from a simple combination of camera and microscope to a most complex piece of elaborate machinery, but without the assistance of the latter a satisfactory portrait can seldom be obtained.

* Concluded from page 279.

---

Photographic Club.—The subject for discussion on April 22nd will be "The Keeping Qualities of Developers"; April 29th, last lantern meeting of the season (visitors invited).

Mixed Hydrochinon and Eikonogen Developer.—On every side we hear of a developer, the composition of which we give herewith. It was first recommended by the Photographic Club, of Paris:—

| | |
|---|---|
| Sulphite of soda ... ... ... | 100 grammes |
| Eikonogen ... ... ... ... | 15 ,, |
| Hydrochinon ... ... ... ... | 5 ,, |

are dissolved in 1 litre of hot water. When cooled, 50 grammes of carbonate of potash are added. This developer is used by many Viennese amateurs, and they confirm what has been said of it, viz., that the mixed bath unites in itself the good qualities of both the hydrochinon and eikonogen developers; it works as energetically as the latter, without, however, veiling the shadows, and gives the characteristic strength obtained with hydrochinon. The temperature of the developer is important—the higher it is, the more energetic the action, and thus a shorter exposure is required.—*Photo. Rundschau.*

## PROCESS OF FIRING PORCELAIN IN FRANCE.

The United States Consul at Limoges says, in his last report to the United States Government, that the proprietors of the large porcelain factories there have been for a long time studying the question of reducing the price of fuel. At a recent congress of the manufacturers it was said that some new and cheap way of manufacturing porcelain must be found for France, or the industry which has become so famous, and which employs so many of the inhabitants, would be driven from French soil on account of the cost of firing. It was there ascertained that the cost of firing china in Bohemia was not more than ten francs a ton; in England it was only thirteen francs, while, for the same thing in France, at Limoges, the cost was between thirty-four and thirty-five francs. This difference being so great, and making it impossible for the French manufacturers to make their china as cheaply as their foreign neighbours, various devices have been tried, but with little success. In order to compete, wages have been reduced to the lowest point, and still the manufacturers are said to have lost money. The coal that is employed is necessarily costly, as a smokeless, long-flame variety is required. Many of the factories burn wood only, as that produces a purer white than the very best kinds of coal, but wood is dearer than coal. It is consequently only used in firing the muffles, and in the finest grades of porcelain. A few years ago a new process was tried, that baked the porcelain in a short time; but the cost made the process impracticable. It was under such circumstances as these that one of the most progressive houses in Limoges was induced to employ petroleum or residuum oils as a fuel; to accomplish which, an American firm using the Wright burner was requested to come and make a trial with the fuel. There was very much doubt and fear connected with the experiment; but, after a time, it was attempted, and the results were far better than anticipated. The heat was shown to be absolutely pure. No gases or smoke in any way discoloured the china, which came from the kiln much whiter, and in better condition, than when it is fired with the best of wood. In the muffles there was a decided advantage. The delicate colours, which show at once the presence of the slightest quantity of gas, were perfect. "This new discovery," says Consul Griffin, "promises to revolutionise the whole porcelain industry." It is estimated that, by employing these oils, there will be a reduction of about fifteen or twenty per cent. in the making of china. The only question now is the present classification of residuum oils in the Customs tariff, as the present duty on petroleum—one hundred and twenty francs per ton—is prohibitive; but strong pressure is being brought to bear on the Government to have fuel oils classified as fuel, which pays only one franc thirty centimes a ton. New life is given to an industry that was seriously threatened; and it is hoped that the French porcelain will be brought to a greater state of perfection by this new American invention.—*Society of Arts Journal.*

London and Provincial Photographic Association.—At the meeting on April 9th, Mr. A. Cowan in the chair, several presentations to the library were announced. It was decided to have another lantern slide competition on the same conditions as the last, the chairman undertaking to provide the negatives. This was the usual monthly lantern meeting, and a number of slides were shown, the work of Messrs. W. Park, J. S. Teape, P. Everett, A. Cowan, S. T. Chang, F. A. Bridge, T. E. Freshwater, &c.

## THE HOLBORN CAMERA CLUB.

The Holborn Camera Club is commencing its fourth year of existence in a very spirited manner, its membership having been recently increased to more than seventy. Arrangements for the ensuing twelve months are being completed, and special attention is being given to the outings during the summer months. Trips to Richmond and Waterlow Park have already been made, and during the months of May and June the Club will visit Pinner, Penshurst, near Tunbridge Wells, Purfleet, Hastings, and other picturesque resorts. A special feature of the year's arrangements is a monthly competition. During each of the summer months one print is to be sent in, and during the winter two lantern slides per month. Special subjects will be set by the committee, and at the end of the two seasons prizes will be given to the members whose prints and lantern slides have received the best average of marks. The Club meets every Friday, and one night a month is devoted specially to the instruction of beginners. Full particulars of membership, &c., can be obtained of the secretary, Mr. J. S. Smith, 97, Tabley Road, Tufnell Park, N.

# Patent Intelligence.

### Applications for Letters Patent.

5,859. George Rydill, 14, Tudor Street, Sheffield, "Improvements in Photographic Printing of a Picture, Figure, or Design, in Conjunction with other Printed Pictures, Figures, or Designs for Useful and Ornamental Purposes."—April 6th.

5,998. Thomas Rudolph Dallmeyer and Francis Beauchamp, 4, South Street, Finsbury, London, "Improvements in Photographic Cameras."—April 7th.

6,172. George Teasdale Teasdale-Buckell, 55, Chancery Lane, London, "Improvements in the Production, by the Aid of Photography, of Surfaces for Printing in Colours, and in the Means and Apparatus employed therein.—April 10th.

### Specifications Published.

17,070. *October 29th*, 1889. — "Automatic Advertising Apparatus." Heinrich Friedrich Meyer, Landwehrstrasse 23, Bremen, in the free State of Bremen and German Empire, Manufacturer.

This invention refers to an apparatus for automatically changing light or reflected pictures and advertisements thrown on suitable places to be reflected and exhibited at a distance from the apparatus. These pictures change automatically at determined intervals, thereby attracting the attention of passers by.

An apparatus according to this invention comprises a magic lantern, a picture or advertisement carrying disc, a clockwork, and a train of wheels for putting the said advertisement disc in motion. In the lantern case, which is provided with a chimney and a door, there is a lamp, the rays of which are reflected by a concave mirror, through an aperture on to transparent plates, which are provided with pictures or advertisements, and carried on the disc. These transparent pictures or advertisements are reflected or transferred in a magnified state, by means of the object lenses, on to a suitable surface, and thereby made visible at a distance.

In order that the then exhibited picture may be exchanged for another, the disc is provided with a series of transparent pictures or advertisements, which can be removed at pleasure and replaced by others. The disc consists of two plates, in which, at certain distances, there are provided radial grooved bars, in the grooves of which the plates can be laid, and are then held tight by means of springs.

To automatically change the pictures by turning the disc, a clockwork contrivance is provided, which consists of two main parts, the works and the train of wheels.

A spring drum acting through a train of wheels imparts motion to the middle wheel, on whose axis the disc is fixed. The movement begins as soon as the pin of the running wheel is set free. This liberation is effected by the clockwork, which is constructed on the principle of an alarm clock, on the minute arbor of which a wheel is set provided with ratchet teeth. This wheel sets the pin free at any desired interval by means of ratchet teeth provided on its periphery engaging with the pin of the lever.

17,284. *Oct. 31st*, 1889.—"An Instrument for Demonstrating Astronomical Phenomena." John George Parvin, of 12, Duucombe Road, Horusey Rise.

This invention is intended to be used for indicating the position in the heavens of any planet, and of the moon, and fixed stars, at what hour the same will rise, pass the meridian, and set. It will also indicate the phases of the moon, and when lunar eclipses will take place.

It consists of a disc on which are drawn a series of concentric circles divided and inscribed appropriately.

Upon the said disc, and attached thereto by guides working on its edge, or otherwise attached so that it may be made to revolve concentrically with the first disc, is a second and smaller disc, on the outer edge of which is a circle divided into twenty-four hours and subdivisions, and in the central part of which, within the said circle, but not concentric therewith, is an opening of such size and shape as to represent the horizon of the place in which the apparatus is intended to be used, say, for instance, London. This disc is capable of being rotated on the first or larger disc, so that the two may be made to assume or pass through any desired relative radial positions, so as to show through the said opening the fixed stars drawn on the first disc visible at any given time.

At the centre of the first disc is attached one, two, or more indexes or pointers so arranged that it, or they, or either of them may be set to any required point or points, and preferably so arranged at the centre that they may be moved a limited distance in the direction of their length and on the said pointer or pointers. Attached to each is a small knob or indicator that may be moved either with, or independently of, the pointer towards or from the centre, and set at any required distance ; it is better to use two pointers, and make one of them "earth" and the other one "planet."

On the first-named—that is to say, the larger disc—is inscribed a series of circles divided and marked as follows, but the order of the circles need not be that stated below, as it may be varied considerably without departing from the invention.

The outer circle of the said disc is divided and numbered to represent right ascension ; the next inwards may be marked with the corresponding signs of the zodiac ; then may come an annular space over which the hour circle, forming part of the second disc, lies ; further inwards may be a circle, or circles, representing the division of the year into months and their subdivisions into days. On the space within these circles are represented some of the principal fixed stars, or so many of them as are within the zodiac.

If preferred, the right ascension circle may be placed nearer the centre and within the lines representing the zodiac among the fixed stars.

By setting the pointer marked "earth" to the day of the month, and the pointer marked "planet" to the right ascension of any planet, and setting the indicator on the planet pointer to the planet's declination, and then moving the apparatus so that the indicator on the planet hand is brought over the eastern portion of the horizon, the time of the rising of the planet is indicated by the pointer on the hour circle, and in the same way the time of its meridian passage and its setting may be obtained, and its position among the fixed stars.

At a meeting of the *Deutsche Gesellschaft on Freunden der Photographie*, Prof. Rietschel sent a ground-glass plate which, it is stated, was made by flowing the glass with a milk emulsion (a mixture of gelatine and milk).

West London Photographic Society.—At the meeting held at Broadway Lecture Hall, Hammersmith, on April 10th, Mr. W. A. Brown in the chair, slides by the following members were shown :—Messrs. Bennett, Chang, Dixon, Hodges, Kellow, Lamley, H. Selby, L. Selby, Varden, Whitear, C. Whiting, and H. F. Wilson.

# Correspondence.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Sir,—Will you allow me again to call the attention of those of your readers interested, to the fact that this Association is still taking steps to enlarge its library.

So far the Society has been helped in this endeavour by the presentation of works bearing on photography from many friends, as well as a considerable number of volumes from members.

While feeling greatly indebted to those who have already been so generous, the members still think that there are numerous well-wishers who, when once they know of the existence of the wants of the library, would hasten to forward gifts of photographic literature for that purpose. Parcels of such, or single volumes, will be gladly received and acknowledged if forwarded to the Hon. Secretary, Champion Hotel, Aldersgate Street ; or to Mr. F. W. Pask, Hon. Librarian, Leyton House, High Street, Leyton.

## THE QUAGGA.

Sir,—Some time ago I advertised in different newspapers in districts of this colony and Bechuanaland *re* the quagga. I mean the districts where he was likely to be found. I have also sent photos of the quagga wherever I thought I could get information. This brought me a host of correspondence from Mashonaland, Bechuanaland, Namaqualand, and the colony. One of the most important letters I have forwarded to Mr. Bartlett.

I learn with disappointment that the quagga is extinct in the lower parts of the colony, but my correspondent, who evidently has studied colonial natural history, and knows what he is writing about, has advised me to write to Namaqualand, where they are said to run over the immense sandy flats of that country. I wrote to two parties, one of which thought there would be no difficulty in getting one or two young ones. I have been careful to point out to them the difference between the quagga and the zebra. The quagga is undoubtedly, from what I learn, a distinct species, and very vicious. When wounded they will turn on anything, and tear limb from limb. The letter sent to Mr. Bartlett gives a detailed account of the life and manners of the quagga, which would be too long to insert here.

Namaqualand is a long way from here. I expect to have another letter in, say, three weeks from now. Should I succeed in procuring one, it is my intention to have him brought down to Prieska. I could then go there myself and arrange to bring him on here. We frequently have waggons here from Prieska. It is about a fortnight's ride from Kimberley. I am very hopeful of success. B. Harvey.

*Kimberley, March 22nd.*

P.S.—I omitted to state in my letter, giving a description of the *modus operandi* in photographing by the wet process at the Zoo, that the bath had a slight addition of potass. nitras. Old workers on interiors will know the why and wherefore. The plate was also backed with a thick pad of wet blotting-paper.

## M. LIPPMANN'S DISCOVERY.

Sir,—As I was the first to raise, in your paper, a doubt—since fully justified by the presidential address delivered at the Camera Club Conference—allow me now a small space in it to close the subject of the so-called discovery of photography in natural colours by a few practical conclusions.

I have strong reasons to believe that : (1) two plates sensitised by Prof. Lippmann's process, and exposed, one to the spectrum and another to an orange transparent glass, *will give the same result* of rainbow hues under identical treatment as to development and time of exposure ; (2) that a blue or yellow glass screen will *not* produce a blue or yellow negative by reflection ; (3) that the effect is most likely due to the extreme delicacy and transparency of support, as collodion or albumen, and not to the sensitiveness of the film.

Whatever may be the value for the abstract science of M. Lippmann's researches, every sensible man will respect his noble endeavours in that direction, but it would be a great pity if thousands of professional investigators should lose their time and means on photographic experiments based upon *un faux point de départ.* L. Nievsky.

*5, Gransden Road (Rylett Road), Shepherd's Bush, April 14th.*

## Proceedings of Societies.

Photographic Society of Great Britain.

At the meeting of this Society held on the 14th inst., the chair was taken in the first instance by Mr. J. Glaisher, the president. After the reading of Mr. Willis's paper the president left, and his place was filled by Mr. J. Spiller, vice-president.

The Chairman gave out that the council had appointed a committee to deal with questions relating to the exhibition, and to act as hanging committee. The members appointed were Messrs. Baggalley, Chapman Jones, Davison, J. Spiller, and Mackie.

A paper on "Platinotype," illustrated by examples and demonstration, was read by Mr. W. Willis. He said that the only new point that he had to introduce was the application of platinum printing to photographing on wood, but there were several observations relating to development to which he would invite attention. The first processes described were those introduced in 1872, 1873, and 1878. In the former process, there was at one stage about equal weights of platinum and silver in the print, but the silver was toned by gold and sulphocyanide, and the finished print contained all three metals. He had not found it practicable to carry the substitution of gold for silver to completion without producing a cold blue tone. In the 1878 process the image was formed of platinum only. In the cold bath process of 1888 the paper was prepared with ferric oxalate or tartrate, and the image developed in a bath which, in addition to platinum, contained a substance capable of acting as a developer. If, adopting the method of Herschel, a solution of silver or gold were applied to the iron-sensitised paper after exposure, an image in either metal would be obtained, but this was not the case with platinum unless some other salt was present to act as developer. There was a peculiarity in the appearance of the image whilst developing in the mixed platinum developing solution. The image at first appeared flat and weak; but the most noticeable characteristic at this stage was that it was granulated; the granulation disappeared as development went on. The difficulty with the cold bath process was to produce a perfect paper equal and regular in quality. The producing of a platinum image on wood was next described and shown. The specimens had been polished, and the wood prints were of considerable depth and richness. He had long experimented in photographing on wood, but had only thoroughly succeeded with the cold bath process. With the hot process he had found it almost impossible to get enough platinum in the image. With the cold process, where the platinum was applied after exposure, this difficulty did not occur. He did not use hydrochloric acid when working on wood, but oxalic or citric acid of a strength of $2\frac{1}{2}$ per cent. instead. Panels of white wood, of which he had found chestnut to be the best, covered with photographs of decorative subjects, were, he thought, of use. In the hot bath process variations of temperature and of strength of the developing solution produced different results. As the image, before development, consisted of a soluble salt, it was desirable to develop in such a way as to obtain the result before much of this ferrous salt was dissolved in the bath. In short, the problem was to accelerate development, but not to accelerate solution of the ferrous salt. To show the effects of differences of temperature and strength of solutions, strips of paper, equally exposed and differently treated in regard to temperature and strength, were handed round. On the whole, a low temperature rather shortened the range. Further modifications could be obtained by various additions, of which hydrochloric acid and chloride of potassium were mentioned.

Mr. J. Spiller recalled the interest which he had felt at the first demonstration of platinum printing before the Society in 1878. He would like to know whether Mr. Willis now preferred that method, or the cold bath process more recently introduced.

Mr. W. E. Debenham pointed out the great range of gradation in the specimens of the 1873 process, containing platinum, silver, and gold, and enquired whether Mr. Willis attributed that to the gloss which appeared on those prints, or to superior rendering of gradation by the process itself.

Mr. Chapman Jones said that with the cold bath process the strength of the developing bath changed with each print put into it. This he considered to be a great drawback.

Mr. J. Gale enquired whether the cold bath process was suitable for rough paper.

Mr. G. Davison said that the question raised by Mr. Debenham was of great importance, if it was a fact that greater truth of gradation was obtainable by one process than by another; but to make proper comparison, prints should be made from the same negative.

Mr. Willis, in replying, said that he really could not say whether he preferred the hot or the cold bath process. He thought, however, that when the paper for the cold process could be perfectly prepared, that process would be by far the best. As to Mr. Debenham's question, gradation was entirely under control. The negatives of the time at which platinum-silver-gold process prints had been made were of a much more vigorous character than those of the present day. He thought the gloss on the prints might have something to do with the gradation. That gloss was entirely due to starch, three coatings of which—with drying between each coating—had been applied to the paper. In reply to Mr. Chapman Jones, there was no difficulty in keeping up the strength of the developing bath by the addition of a certain quantity of fresh solution for each small number of prints placed in the developer.

A specimen of M. Lippmann's so-called photography in colours was then submitted for inspection. It had been brought to this country by Dr. Lindsay Johnson.

The Chairman, Mr. Spiller, looked upon it rather as an iridescent film than a true specimen of photography of the spectrum. There was a red place which might be assumed to correspond to the red end of the spectrum, and a green place; but no other colours were visible.

Mr. T. Bolas thought they could hardly assume, unless it were so stated, that the red on the plate corresponded to the red of the spectrum, and the green to the green. Capt. Abney had been understood to say that each colour required an exposure of a certain time to render itself on the plate, and that a shorter or longer exposure would produce another colour, in which case any colour might serve for producing the whole series. This particular photograph was nothing like so good a rendering of the spectrum as the one on albumen paper recently shown by Mr. Warnerke. Probably it was known to most present that Becquerel had obtained results much more suggestive of the spectrum than the one now before them. Most photographers had obtained an iridescent appearance on the edges of plates and on waste plates that was more like the spectrum than this. He appreciated M. Lippmann's services to chemistry—he was a man of science; but it did not appear to him that he had advanced the solution of the question of photography in colours.

Mr. Chapman Jones noted that M. Lippmann had succeeded in fixing his image, which Becquerel had not done. This, he thought, was the chief point in M. Lippmann's work.

Mr. L. Warnerke believed that Poitevin had succeeded in fixing the image. He then exhibited the photograph referred to by Mr. Bolas, which he thought had nothing in common with M. Lippmann's. As the red and deep orange had shown no action in the time (half an hour) which sufficed for the other colours, these two had been exposed for two days. The differences of colour in his examples were not due to mere amount of chemical action, for when he had exposed under a sensitometer screen, the image was of a brown colour throughout. He had not succeeded in fixing these images.

Mr. W. H. Harrison said that probably the first Daguerreotype was no better than the feeble specimen of M. Lippmann's work exhibited that eveniug, which their assistant secretary had said was given to Dr. Lindsay Johnson with reluctance, as the worst specimeu M. Lippmann had ever taken. He would ask their secretary if the specimeu had been exhibited to the Photographic Society of Great Britain that eveuing with Professor Lippmann's knowledge and cousent.

The Assistant Secretary replied that he did uot know.

Mr. Harrison continued that, therefore, any public discussiou upon it might be uujust to M. Lippmanu, who had proved the truth of the theory, first published by Lord Rayleigh, that heliochromes were due to the interference of light, aud could be fixed. It was too late iu the day to question the geuuineness of the discovery, which had been recognised by the members of the Academy of Sciences of Paris aud the Photographic Society of France, many of them accomplished men of science, and all truthful and honourable gentlemen, which meaut a great deal.

Mr. H. M. Elder said there were three different methods of producing photographs in colour: that of Nièpce de St. Victor, which was the plan adopted by Mr. Warnerke; the method of diffraction scattering small particles; and Lippmann's method, founded on Lord Rayleigh's paper on wave motion in a loaded medium.

The Chairman, in thanking Mr. Willis for his paper and demonstration, and Dr. Lindsay Johnson for bringing the specimen of M. Lippmann's work, said that he hoped they might yet see better specimens of the latter kind. In this specimen, although two colours could be seen, there was nothing in the nature of a photograph of the spectrum.

Messrs. C. T. Dent, J. H. Waller, and T. H. H. Harrisou were elected members.

### Camera Club.

On April 9th, the day following the close of the Annual Conference, there was a large gathering at the Camera Club, to attend the flash-light demonstration given by Mr. Cade (of Messrs. Marion and Co.). The "Slingsby" apparatus was used, and some very successful uegatives were taken of the room aud the company.

Mr. Stromeyer showed some prints from negatives taken with magnesium ribbon placed in the ordinary peudant lamp of a room, the lamp being in the picture. One of these showed very picturesque lighting.

Dr. Crocker handed round some photographs of medical cases, showiug the service rendered by flash-light on such subjects.

On Thursday, April 23rd, Mr. Frank Howard will read a paper on "Photography in Bye-Ways and Field Lanes." The paper will be illustrated by the lantern.

### Croydon Microscopical and Natural History Club (Photographic Section).

*Friday, April 10th.*—Mr. F. H. Baldock, F.C.S., in the chair.

Mr. J. Wier-Brown explained aud demonstrated his system of producing warm brown tones and sepia tones on bromide enlargements. He had slightly, but not materially, altered his mode of procedure since the first publication of the process. A number of landscapes were handed round, showiug both brilliant and soft effects in rich brown and sepia.

The speaker's attention was drawu to a paragraph iu a mouthly photographic publicatiou, in which it was stated that, if you left a bromide print thus treated for several hours iu plain water, you would find the image almost goue. He said this was very misleading, and a most incorrect statement, and might deter some workers from trying the process for themselves. It was true *only* as regards a print in which the toning had been carried to its extreme point, "a bright red," a colour which he thought would be seldom desired by photographers. That it was entirely untrue as regards prints toned to the warm brown or sepia point, he demonstrated by showing the two halves of a warm sepia proof mounted side by side, oue portion of which had beeu washed in running water for twenty-eight hours, without apparent, if any, reduction of the image. Prolonged washing after touing was quite uunecessary, and would not be resorted to by workers except by way of experiment. From five to ten minutes in running water was quite sufficient to remove the faint lemou-coloured stain from the high-lights, after which the prints should be carefully blotted off, and dried in a warm room. Prints so treated had been quite unaffected by all the light to which they could be exposed siuce they were first produced, and Mr. Weir-Brown stated his belief that they would withstand the action of the most trying atmospheric conditious to which photographs were subject under ordinary circumstances. If not satisfactory, the tone could be removed by prolouged washing, the print restored to its original colour, aud afterwards re-toned. The process was put forward for the benefit of those only who wished to make enlargements in tints warmer than the usual black-and-white of bromide, there being already abundant methods of producing every variety of colour on contact prints. The speaker stated that good results could not be produced on the most rapid papers, and that his success had beeu obtained on an emulsion of medium rapidity called by its makers "slow."

Mr. W. Low-Sarjeant exhibited and explained a uovel camera which he had just made for his own use. The camera is of the usual box form, covered with leather, and is divided into two chambers, the upper one being used simply as a view-meter, or to focus with for hand-work, and giving a full-sized view identical with that in the lower chamber or camera proper; the picture thus being seen aud focussed at the moment of exposure. A reflector placed at au angle of 45° in the upper chamber throws the image on to a ground glass which is fitted in the top of the camera, the ground glass being covered with a rectangular hood large enough to euable the image to be well seen in the brightest light; this hood, when not in use, folds down flush with the top of the camera. The lower chamber, or camera proper, is fitted with a swing back and focussing screeu for ordinary work. It is also fitted with a specially constructed focussing eye-piece hood, which entirely dispenses with the necessity of using a focussing-cloth. Double backs of a very light pattern are used, and the camera has a range of focus from three to twelve inches. A very iugenious shutter is fitted behind the lens—so that the lens can be changed without interfering with it—giving a rauge of exposure from extreme rapidity to hours if required; it is discharged by means of a pneumatic ball. A very novel feature in the shutter—which, by the way, gives an equal exposure to every part of the plate—is that, whatever speed the shutter is set to work at—even at its fastest—at the moment of exposure, without any alteration whatever to it, a time exposure of auy length can be given. The camera is also fitted with a black glass reflector placed in front of the working lens at the angle of polarisation 33° 15′ for photographing clouds. When not in use, the reflector folds into the front of the camera out of the way, or it cau be removed entirely. A false bottom with arc-shaped struts is attached to the camera to enable it to be tilted to the necessary angle for cloud photography. Although the camera contains so much, and is capable of doing every class of work, it is very compact; the quarter-plate size, with a 5½ inch lens focussed ready for use, ouly measures externally 8½ by 7 by 6 inches.

The next meeting will be held in the old school of art room on the 17th inst., when there will be an exhibition of hand-cameras.

The first excursion of the Photographic Sectiou of the Club took place on April 11th, when, by the permission of the Lord Archbishop of Canterbury, Addiugton Park was visited. The afternoon was fine, aud some good work was done.

### Birmingham Photographic Society.

*April 9th.*—Meeting at the Club rooms, Midland Iustitute, Mr. W. J. Harrison, F.G.S., in the chair, when five new members were elected.

The hon. secretary, Mr. A. J. Leeson, exhibited Wray's aluminium-mounted lens fitted with iris diaphragms. The lightness was remarkable, aud in point of fiuish perfect.

The programme for ensuing session was read as follows:—April 23rd, "Exposure and Development," W. J. Harrison; May 28th, "Stereoscopic Photography," Walter Griffiths;

June 25th, "Cameras and their Management in the Field," E. H. Jaques; July 23rd, Conversation Meeting and Exhibition of Survey Photographs; Aug. 27th, Development Competition; Sept. 24th, "Lantern Slide Making," S. H. Fry.

Mr. J. T. Mousley (excursion committee) read the list of excursions for the year.

The Chairman remarked that he was glad to see that the excursion committee had arranged for many of the outings to interesting spots in the Hundred of Hemlingford, which would greatly help the Survey Section in that important work.

Mr. Howson, in the course of remarks on alpha paper, said that with it different tones could be obtained, which was a great advantage and help, in many cases, to enhance the artistic value of a photograph, as one was able to give special tone to any separate subject by different exposure, different length of toning, &c., and also pictures might be made of uniform tone under varied forms of development, &c. After fully describing the process, Mr. Howson gave a practical demonstration of the mode of work, producing the varied tones by different ways of manipulation. He then showed the exposure and development of the Ilford special lantern slide plate, giving four distinct exposures from the same negative, and, by development in same developing solution, obtained exactly the same result, thus showing great latitude in development and exposure.

---

Hackney Photographic Society.

A meeting was held on Thursday last, Mr. J. Hubert in the chair.

This being an evening set apart for "Hand-Camera Work," by Mr. Walter D. Welford, some hand-cameras were shown, among them being the "Radial," which was explained by Mr. Dickenson, and the "Repeater," shown by Mr. Cusworth. Mr. Gosling showed his, a home-made one with dark backs.

Mr. Welford preferred to illustrate the uses of a hand-camera by means of the lantern. Nearly 200 slides were put through illustrative of various branches of photography, such as architecture, marine, detective work, &c., and were humorously described by Mr. Welford. The slides shown were good.

---

Holborn Camera Club.

At the meeting at the Club rooms on Friday last, the president, Mr. T. C. Hepworth, in the chair, Mr. J. Traill Taylor read his promised paper on "Art in Relation to Photography."

He commenced his observations by saying that he did not intend to give a formal lecture, but an informal talk. Painters, he said, would always have the pull of photographers because they could, like the bee, sip their honey in the shape of subjects from all sources, and could afterwards, at their leisure, and at home, select those which they preferred and bend them to their purpose, and eliminate others which they did not want. Photographers, on the other hand, had to take nature as it came, and had to be content with what they saw before them, and, considering how they were handicapped in this respect, he considered it very wonderful that with regard to composition, they succeeded in holding their own as well as they did.

We must remember that photography is an art as well as a science, and that there are certain received canons of art which must be observed. Painters have been so well grounded in these that they are apt to turn upon the poor photographer for the slightest fault which may be looked upon as an infringement of those canons.

In photography the first thing to learn is about the tools which were employed, but, assuming that this elementary knowledge had been already acquired by the members of the Club, he would not dwell upon that phase of photography, but would proceed to make a few general remarks upon the composition of pictures, and would illustrate his words by a number of photographs—a great many of which he had brought as examples of what to avoid. After a few words with regard to the importance of placing the horizon at a height regulated by the subject, he showed examples in which attention to this point had been disregarded. Straight lines, repetition of forms, and other common faults, also came under review. The posing of single figures, the redundance of accessories, and over-elaboration of dress, in causing the eye to stray from what ought to be the principal point of a portrait; the face, the posing of groups—illustrated by some very amusing examples—formed another section of the discourse. In connection with these groups, Mr. Taylor again referred to the very uncomplimentary remarks common to painters when criticising photographs, and showed some examples of a well-known painter's photographs, which were certainly open to censure as specimens of composition.

A short discussion followed, and the meeting closed with a vote of thanks to Mr. Taylor for his kindness in reading such an interesting paper.

---

Putney Amateur Photographic Society.

*April 8th.*—Rev. L. Macdona in the chair.

A set of "American" slides were exhibited to members and friends. Those of the ruins of Johnstown were of special interest. It was suggested that, had particulars as to plate and developer used, &c., been given in each case, instead of the maker's name, it would have been of greater interest to photographers on this side. The ingenious method of packing was also commented upon.

---

Brixton and Clapham Camera Club.

At the meeting held on the 9th inst., Dr. Reynolds occupied the chair.

Mr. Bevins gave a lecture on "Light," illustrating his remarks by diagrams and experiments with the Club lantern, and giving instructions for testing the safety of glass for dark room lamps by means of a prism.

The annual Club exhibition of members' work will be held at Gresham Hall, Brixton, this and to-morrow evening. Lantern shows will be held each evening, and a concert will be given on Saturday.

---

Richmond Amateur Photographic Society.

Friday, the 10th inst., was a lantern night for the exhibition of a series of American slides, and for deciding the slide competition. Mr. Horrigan presided. The American slides were first shown, after which voting on the competition slides took place. Each competitor was required to submit one contact slide from each of three negatives supplied for the purpose by Mr. Cembrano, and the result of the voting was to place Mr. Ardaseer first and Mr. Garrett second, while Messrs. Davis and Ford tied for third place.

The Society was indebted to Mr. Cembrano for the loan of his lantern.

---

North Middlesex Photographic Society.

*April 13th.*—Mr. J. W. Marchant in the chair.

Mr. Birt Acres, on the subject of "Monochromatic Rendering of Colours by Photography," said that it naturally divided itself into two portions, the historical and the practical. He gave a chronological *resumé* of the growth of photography in general, and of the researches into colour-sensitive dyes for the photographic plate in particular. The great mass of photographic workers, unless their attention had been specially directed to the subject, had little knowledge of the slow and laborious manner in which the science had been built up. The properties of lenses had been known as early as 420 B.C., a lens having been found in the ruins of Nineveh. From mediæval times till to-day, there had been an ever-increasing army of workers adding to the store of general knowledge. He instanced Roger Bacon, Baptista Porta, Kircher, Newton, Wedgwood, Humphrey Davy, Nicephore Niepce, Daguerre, Herschell, Read, Mungo Pontou, Faraday, Fox Talbot, and others, briefly pointing out the nature of their discoveries, and the dates at which they were made known. The early workers had attemped to secure the colours seen on the ground glass screen in various ways. Some had tried to obtain reproductions of the colours separately, and to combine them into a whole, and had used glasses of various tints to separate the colours. A difficulty met with was the reflection from every coloured object of white light. He then dealt with the colour-sensitive dyes which had been tried—eosine, erythrosine, cyanin, chlorophyll, &c., and said that the addition of ammonia, discovered and patented by

Tailfer and his colleagues, had been the factor necessary to secure success. By means of a prism, the lecturer projected on the screen a spectrum of the oxy-hydrogen light, showing the colours in great brilliancy. He pointed out that the ray which is lightest in tone to the eye was yellow, the others following in the order of light—blue, green, orange, red, and deep blue and violet. The rays, when photographed upon an ordinary plate, were more or less reversed, the blues and violets showing brightest. He then interposed coloured screens of various tints, showing how they cut off various rays. A series of monochromatic bands were then thrown on the screen, showing the spectrum photographed on ordinary and colour-sensitive plates with and without coloured screens. The series showed clearly that a very pale yellow screen, necessitating about a triple exposure, gave results in monochrome most nearly approaching the effects of colour as seen by the eye. Copies of paintings, portraits, and views, taken in duplicate on ordinary and isochromatic plates, were then thrown on the screen. The lecturer said that the difference in the cases of the portraits and the copies of oil paintings were so marked that he found it necessary to state that no retouching had been done. The views taken on ordinary plates were so good that it seemed nothing better could be wished for, yet, when the duplicate taken on the isochromatic plate was shown, the improvement was strongly visible.

Reports on plates and paper submitted for test were then given, and further samples of other dealers were distributed to be similarly dealt with.

---

Sheffield Photographic Society.

*April 7th.*—At the Masonic Hall, Surrey Street, Mr. B. J. Taylor in the chair.

It was arranged to have Saturday afternoon excursions, commencing May 9th to Oughtybridge; also that the first monthly excursion should be to York early in June, date to be arranged.

Mr. Alleyne Reynolds then gave his lecture, "A Tour Round Iceland," which was illustrated by a large number of slides, the negatives and slides being made and taken by the lecturer after having made four trips round that island.

---

Oxford Photographic Society.

*April 7th.*—The president, Mr. E. A. Ryman-Hall, in the chair.

Mr. A. F. Kerry, M.A., Exeter College, gave an instructive lecture on "Bromide and Kallitype Paper Printing." Many chemical experiments were made, showing the changes which take place in developing, &c. Some bromide prints were made, and the subsequent manipulations were carried out. The lecturer then spoke briefly on the Kallitype process. The development of some prints brought the lecture to an end.

Mr. Claude Rippon (Merton College) and Mr. H. H. Isons were elected members.

---

Leicester and Leicestershire Photographic Society.

*April 8th.*—After transaction of routine business, Mr. Porritt read his paper entitled, "Photography, Past and Present," with notes on the quality of dry plates and lantern slides, and a few remarks on the object of our excursions. During the course of his remarks, Mr. Porritt reviewed the practice of photography from the earliest date of collotype and wet plate processes, describing *en route* the *modus operandi* of each process, which was quite novel to the greater part of the members; from thence he described the gradual transition through the various wet processes up to the almost perfect condition attained by the present dry plate. Lantern plates were then treated, the lecturer betraying a considerable leaning towards the collodion made slide, some excellent specimens of which were passed round. Some good advice to the members with respect to the management of the forthcoming excursions was then offered.

The President (Mr. Pierpoint), in proposing a vote of thanks to Mr. Porritt, traversed at some length some of the points advanced by him with reference to the use of rapid *versus* slow plates for landscape.

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

H. B. (Reading).—*Direct-Printing Platinotype Paper.* You would do well to consult the practical guide issued a few years ago by the Photographic Society, entitled "Platinotype by Captain Pizzighelli and Baron Hubl," edited by Captain Abney, price two shillings (Harrison and Sons, 59, Pall Mall). Also, look for the report of Tuesday's proceedings, when Mr. Willis described the cold bath process and other modifications of the platinotype.

S. W. (Nottingham).—*Blinds in the Studio.* A very good arrangement is to have a set of dark green holland blinds, running on spring rollers fixed at the highest point in the roof, supplemented by blue gauze curtains working horizontally. Besides these, it is well to have the usual paper screen near the sitter, to diffuse the light and soften the shadows; and to place the camera beneath a hood, so as to shield off the top-light from the lens.

Optician.—*Toning Collodion Transparencies.* You should find no difficulty by using an excessively dilute solution of chloride of gold. Some prefer platinum, or the mercury and ammonia treatment, for a pure black. Will not the gelatino-chloride lantern plates suit you better, for then, as Mr. Cowan has shown, by merely altering the developer an infinite variety of tints can be obtained?

G. E. M.—*Gelatino-Bromide Emulsion.* The hand-coating of plates is practically abandoned, so that we can hardly promise you a good sale for the emulsion, however excellent the quality. The sensitive paper business is rather more hopeful, but several good sorts have already established themselves in public favour.

M. P.—*Photography in Colours.* A coloured electric spectrum of M. Lippmann was shown at the Parent Society's meeting on Tuesday, but only pink and green were apparent in the little specimen plate exhibited.

Inquirer.—*The Canadian Co-operative Scheme.* We have seen the promising advertisement in our contemporary, which seems to be put forward in good faith, although it partakes somewhat of the character of the personally conducted scheme shadowed forth in Mr. William Black's "Donald Ross of Heimra." £50 is said to defray the cost of transport, equipment, and all preliminary expenses, and the emigrant photographer has three courses open to him at the end of his first season, one of which is to return to England without losing any of his capital or accumulated profits. Write for the full particulars promised by the middle of the month, and judge accordingly.

A. M.—*Five Years' Old Dry Plate.* Our friend has shown us the transparency, and kindly given further explanations. He exposed for a portrait in 1886; then the plate (X L Edwards') was laid by, forgotten and undeveloped, until a fortnight ago he exposed again for a photo-microscopic object, and proceeded to develop with hydroquinone, when, to his surprise, a good portrait transparency of the original subject came out, showing no trace or outline of the microscopic object, although the subsequent exposure may have had the effect of converting a latent negative into the reversed image which he obtained on development.

Received, the *Weekly Scotsman* and *Kent Coast Times* of last week, each of which devotes a full column to the report of photographic matters, the former treating of amateurs' requirements under the head of "Photography as a Hobby," besides reporting lectures delivered in Edinburgh by Mr. F. Dundas Todd and Prof. Hunter. The latter news-sheet describes a famous professional studio on the south coast, in contrast with the operations of the camera fraternity on Ramsgate sands.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1703.—*April* 24, 1891.

CONTENTS.



## MR. SUTTON'S BLOCK PROCESS.

We last week gave in detail the results of certain experiments which we had made, and which were suggested by Mr. Sutton's paper on "Electro-Phototypy" read at the Camera Club Conference. The results we obtained were of a negative character, but an experiment generally has the advantage of teaching something, even though the primary object in making it may not prove to be attainable. It was certainly so in the case before us. First we ascertained that, owing to certain differences in the manufacture of gelatine plates, some will, after development with pyro, stand a great amount of heat, even while the gelatine retains water and is in a swelled condition; but that with others the gelatine, on application of heat, will either contract or melt off the glass entirely. It would, perhaps, not be difficult to trace the reason for this different behaviour in this respect on the part of certain well-known commercial plates, but it is not necessary, for our present purpose, that we should do so. We also ascertained that, in adapting Mr. Sutton's process to line subjects, such as are ordinarily turned into blocks by the zinco process (some of which illustrate an article on another page), the gelatine film which had withstood the heating operation refused to bear the ordeal of the electrotype bath. One more observation noted was the fact that, as might be expected, the relief on the gelatine plate, brought about by the application of heat, was very much greater while the film remained in its swelled condition, than it was subsequently when the plate had been dried.

This last observation made it at once obvious that, if we could obtain some kind of mould from the relief while in the latter condition, and in some material which would not suffer from immersion in the copper bath, so as to obtain a metal reverse from that mould instead of from the gelatine plate itself, a double advantage would be gained: firstly, in obtaining higher relief for the lines of the image; and secondly, in preserving the gelatine from destruction in the copper solution. The interposition of this mould would, of course, indicate the use of a negative instead of a positive image in the initial operation, but that is a mere matter of detail. With this view, we sought to obtain a cast of the gelatine plate in the finest plaster of Paris.

It was easy enough to pour the liquid plaster on the film, but, unfortunately, we could not persuade it, after hardening, to separate from it without partial destruction of the image. And even had this experiment been successful, the necessary waxing of the plaster before immersion in the copper bath—so as to destroy its porosity—would most probably have degraded the finer lines of the picture.

Our next experiment was more successful. We in the first place took a vigorous black-and-white negative from a line drawing, and from this a positive on a gelatine plate. This was developed, fixed, washed, and heated in the metal dish, according to Mr. Sutton's method, the heat being continued in a moderated form until the film was bone dry. Still keeping it in the metal dish, we surrounded it with an edging of wood about half an inch in height. We now melted in a ladle half a pound of ordinary fusible metal, which liquefied at a heat of about 150° Fah. Keeping this stirred with a stick of wood, so that its heaviest component, mercury, should not sink to the bottom of the ladle, we poured it carefully on the film. The result was encouraging, but by no means perfect, for the metal acted, to some extent, on the gelatine film, and made it granular, the granularity imprinting itself faithfully on the metal covering.

We now took another positive which we had in readiness, and, after obtaining the relief as before and drying it, we placed upon it a trace of vaseline, and then rubbed as much as possible of the greasy matter from it with the palm of the hand. This plate was now warmed in the metal dish, and once more the fusible metal was poured over it. In about ten minutes surface crystallisation showed that the metal had solidified, and it separated easily from the film, leaving the latter quito uninjured. From this metal plate we afterwards obtained an electrotype block, but we are not satisfied with the result, for the relief is hardly pronounced enough for ordinary printing.

There is also another way of obtaining a mould from a gelatine film of this kind, and that is by the hot moulding process commonly used in reproducing Meisenbach blocks, in preference to the common wax mould obtainable by pressure. In this hot process, a mixture of gutta-percha and other ingredients is heated, and while the plate to be copied rests upon a hot metallic surface, the mixture is poured over it, and afterwards slowly cooled. This process gives sharper results than the ordinary wax mould method, and it is easy enough to obtain an electrotypic copy from a mould so prepared.

In Mr. Sutton's paper read before the C. C., he said: "I must be understood as distinctly referring to half-tone block work." It is only fair to remind our readers of this fact. In our experiments we have trespassed on ground which Mr. Sutton had no intention of touching, and we have done so in the hope that others may be encouraged to experiment in a very interesting and important branch of photographic work.

## THE PROFESSIONAL SHOW-CASE FROM AN AMATEUR'S POINT OF VIEW.

BY REV. F. C. LAMBERT.

I CONFESS at once that curiosity often tempts me to stop and examine the contents of the photographer's show or door-case. I am willing to admit that there may be a measure of selfishness in the matter. It may be a wish to see how others manage to overcome what to me are difficulties, or to gather a hint in the matter of pose, lighting, or grouping; or it may be to air my vanity and pat myself on the back, metaphorically speaking, for the creditable way I have managed home portraiture under difficulties as compared with my more fortunate brother with his studio, screens, backgrounds, and other accessories.

Whatever be my motives, it is only befitting that, having had "more than I paid for"—as one ungenerous individual described my silent survey of his collection of yellow smudges—I should attempt to make some return by way of offering a suggestion or two. It may be as well, in the first place, to clear the ground by drawing attention to what, I cannot help feeling, are possible mistakes on the part of my professional brethren. They may often arise simply from want of thought upon so simple a matter, or it may be that they are too much occupied to attend to such trifles, yet I cannot think I am far different from an average specimen of the general public when I say that I, almost unconsciously, picture to myself the man, and also his surroundings, when I see his work. I have had the good fortune to make the personal acquaintance of a good number of professional men, and, with one or two exceptions, found them all I could wish. At the same time, more often than not, has my first impression, usually gathered either from the show-case or the window, been practically confirmed by the habits and character of the man.

It is chiefly to this point to which I would suggest some attention be paid. Supposing a family are taking a short holiday at a seaside resort. It is just such a time that the inclination and leisure are both favourably disposed towards the family party "being taken." What is more natural than that the party will first scan the various show-cases in the place, and be guided, not so much by the success of any one portrait, seeing that the "specimens" are probably unknown to the spectators; nor will they be wholly guided by price, because, when on a holiday, a few shillings saved in one way is spent in another; but the selection of the firm to which is to be entrusted the "portraiting" of "Pa, Ma, and the youngsters," will be decided by the *general impression* and variety of subject displayed, together with the general good taste running throughout the whole collection, which is felt rather than seen. One offensive specimen will undo the good effect or impression of half a dozen other satisfactory pictures. This point brings me to my first suggestion, viz., quantity or number.

I think it is a mistake to have too many specimens. When a window is full of photographs, the eye goes from one to the other, and is wearied by the very number of things to be seen, so that no one particular specimen is carefully examined, *i.e.*, no one makes any special impression. The mental effort is cut up into a shower of fine drops, instead of being pleasantly drawn into a stream. The expression for the general idea which most people get from looking at a window or case over-crowded with specimens, is that the contents are "very much of a muchness," and by this expression they simply mean that they have received no distinct impression of *quality*, and only a bewildering one of *quantity*.

Speaking as one of the general public, I should say, for myself, that I do not care to see more than a dozen specimens in any one case, and that I should prefer half-a-dozen —worth looking at. The half-dozen might stimulate the wish to see more; a score would make me feel I had seen more than enough.

But when, to the distraction of number, I find myself face to face with what I am told is a "cut-out" mount—viz., a contrivance whereby some two or three dozen portraits (of people who have nothing whatever to do with each other) are made to appear from behind a number of openings of very various shapes and sizes—and when, to this highly distressing arrangement, we add the utterly inexplicable device of causing these poor victims to appear tilted at all sorts of angles, then I am disposed to say to myself that the person who is responsible for this contrivance has made a mistake when he describes himself as "artist-photographer." The prevailing idea of this arrangement sometimes takes the alternative form of substituting for the one mount with many openings a large number of exceedingly thick mounts with gilt (real or sham) bevelled edges. These remarkable mounts are often adorned by a number of brass nails, whereby the structure is fastened to the back of the show-case; and, in order to introduce a dash of "high art," the case is not infrequently lined by very inferior velvet of a bilious green or yellow tint. It would be interesting to know why these extremely thick mounts are used for this purpose, seeing that they correspond to nothing ever seen outside the show-case.

From thick to thin mounts one may go at a step. A short time ago I saw some very nicely executed silver prints mounted on very thin cardboard, and attached to the back of the case by means of a couple of drawing pins for each mount. The natural result was that the mounts had curled so much that I could not help thinking that three of them placed edge to edge would make a very fair cylinder.

It is now very generally admitted to be a mistake to mix silver prints with others made by any of the black-and-white processes; and yet how often this is done, to their mutual detraction!

It is also, I think, a mistake to place your price list as a centre piece, and arrange your specimens in circles round it. By all means have your list of terms in a position where it can be easily seen and read—preferably towards one corner—for many people are reticent in entering a place of business simply to learn the charges. It is worth remembering that you do not wish to convey to the outside public the idea that your first and only thought is your price list, but rather that your chief aim is to produce *first-class work*, such as you can conscientiously ask a fair price for, and not be ashamed of the one or the other.

Again and again has attention been drawn to the twofold nuisance of show-cases not air-tight. On the one hand, a covering of condensed vapour on the glass is very annoying to the spectator; on the other hand, the presence of moisture to this extent is very far from being conducive to the longevity of the specimens. In most ordinary cases a few pence spent in the rubber door-lining would provide a ready means of very greatly mitigating this self-evident oversight.

There is, perhaps, even less excuse for the man who is content, week by week, to let his show-case present itself to his possible patrons with a cracked glass. If the artistically arranged show-case indicates an artistically minded proprietor, does it not follow that the cracked glass betokens a ! ! ! ! ?

Finally, as regards including in your show-case objects other than photographic specimens—*e.g.*, flowers, &c.—upon this matter I propose to say something hereafter, but now merely saying that if you desire to include flowers, see that they are renewed occasionally. I remember being detained at a railway station for some time, and was glad to find anything to help to occupy the mind. I did find a show-case containing what had once been flowers, but alas! there was at that time only to be seen a few dried-up brown stalks, and a little pool of putrescent water, very thick, very brown, and no doubt a perfect ocean of specimens for the microscopist interested in *infusoria*. And, by the way, to make the museum more complete, there were to be seen about half-a-dozen dead flies who had found their way into this chamber of horrors and been overcome by its contents. In the lower part were displayed a few pipes, cigar holders, &c.; and, as a background for these very useful "weapons of peace," was displayed a notice to the effect that the proprietor, in addition to his occupation of photographer and tobacconist, also catered for the public in the way of Furnished Apartments, and that his own particular requirement at that moment was thus stated: General Servant and Plain Cook Wanted.

*(To be continued.)*

London and Provincial Photographic Association.—April 30th, "Demonstration on the Polarisation of Light," J. J. Briginshaw; May 7th, "Toning Bromide Paper," J. Wier Brown; May 14th, last lantern night of the season.

Royal Institution.—Dr. E. E. Klein, F.R.S. (Lecturer on Physiology at St. Bartholomew's Hospital), will on Tuesday next, April 28th, begin a course of three lectures on "Bacteria—their Nature and Functions" (the Tyndall Lectures); and Mr. H. Graham Harris, M.Inst.C.E., will, on Saturday, May 9th, begin a course of three lectures on "The Artificial Production of Cold."

## A NEW ELECTRIC LAMP.

For many years the limelight has now held its own as an illuminant *par excellence* for the optical lantern; and it has been more used in this way than for any other purpose. Attempts have been made to enlarge its employment, and about thirty years ago it was tried for street illumination, but was speedily discarded. For the one work of illuminating magic lanterns, nothing has been found to improve upon it.

It may be different in a short time; that is, when electricity is laid on to our houses as gas is at present—a consummation devoutly to be wished, except, perhaps, by the gas companies. We shall then be very glad to put away our gas bags or cylinders as the case may be, to discard our rubber tubes and all other paraphernalia pertaining to gas, and procure an immediate light by the mere act of connecting our lantern with a couple of wires.

It is true that the electric light has already been tried for lantern work, but the inconveniences attached to obtaining the current from battery power, to say nothing of the expense, has hitherto made such trials only of an experimental nature. We may, of course, except the occasional use of an electric lantern in lecture halls for producing spectrum phenomena, and many of our readers well know that such lanterns have been advertised by our leading opticians for some time past. Such a lantern was constantly in use at the old Polytechnic Institution for explaining the elementary facts connected with spectrum analysis to popular audiences. In that case the necessary electrical energy was furnished by a battery of from fifty to sixty Grove cells, until the dynamo became available, when the tiresome and dirty batteries were at once discarded.

Of more recent times, too, and since the electric light has become more or less common in our public institutions, it has been tried for lantern work. Dr. Fleming has devised a special form of incandescent lamp, which he has adapted to the lantern by modifying the usual arrangement of the carbon filament, and making it in the form of a coil. He has thus succeeded in concentrating the light in one spot—an essential feature in any good illuminant for the lantern. But it is obvious that the incandescent light, under the last circumstances, cannot give sufficient radiance for an optical lantern except the instrument be of small capacity, and fitted for small lecture room work or home use.

A better idea of what can be done can be gleaned from the lantern which is now commonly used at the lecture theatre of the Society of Arts. This lantern is furnished with an arc lamp or regulator of the Siemens pattern, and the electric energy comes from a De Meritens dynamo machine, which is driven by a gas engine in the basement of the building. We have often seen this lantern in use, and we may at once say that its working, generally speaking, is not half so satisfactory as the familiar limelight. The light is cold and blue in tone, and, through shifting of the arc from side to side, the light is often removed from the correct optical centre, with the result that part of the screen suffers partial eclipse. It is evident that a better form of regulator than this is needed, and certainly a better one is that known as the Brockie Pell, as modified for lantern and lantern microscope use by Messrs. Newton.

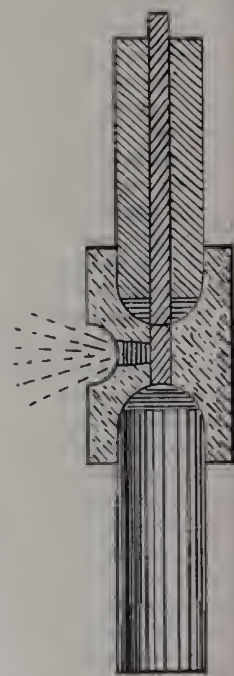
Before proceeding further, it may be just as well, for the benefit of those who are ignorant of the arc lamp, to say a few words about the difficulties with which anyone designing such a lamp for lantern use has to contend. The essential feature of the arc lamp or regulator is the presence of two carbon rods, generally placed vertically one above the other. No light is apparent so long as these two carbons remain separate, and even if a piece of paper be the only screen between them, still no current can pass. But directly they touch, the circuit is completed, and if they are then separated the arc or arch of light plays between them. This arc is, however, almost non-luminous, the light being wholly derived from the ends of the carbon rods being brought to a white heat. If, however, from any cause the light should cease, the carbon rods must again be brought together to touch one another before the arc can be re-established. So that in every contrivance called a regulator or lamp, provision is made for the carbons to touch and then to separate from one another automatically, so that the arc can be maintained. If the carbons were to remain touching, they would simply turn red hot at the ends, fuse together, and very little light would come from them.

If the reader will bear the necessities of the case in mind as just described, he will be able to appreciate the advantages of employing for projection purposes a lamp of the kind now to be described. It is in reality a combination of the arc and incandescent systems, and the quality of the light produced is superior to that given by either. This form of regulator, which is known as the electric sun lamp, was first introduced in Belgium about ten years ago. At once public attention was attracted to it—as it is attracted to anything new—and a few years later we find that the same lamp was awarded a gold medal at Paris. In 1882 it was first shown in this country, and everyone remarked how it differed from most other regulators in giving absolute steadiness of light. At the Health and Inventions Exhibitions at South Kensington it was again honoured by being medalled. But, although its construction showed much novelty and ingenuity, it had faults which prevented its coming into common use. These faults have since been remedied, and as we saw it in use a week or two ago at the St. Pancras Electrical Exhibition, we at once recognised its value for projecting purposes. The improvements have been carried out by Mr. F. R. Boardman, and, without describing them in detail, we may say that the principal one is a provision for making the lamp automatic in its action—a quality which, before Mr. Boardman took it in hand, it did not possess.

As just explained, this lamp is a cross between the arc and incandescent systems, but possesses advantages which neither one nor the other alone can boast. The lamp consists of a small metal insulated box—that is to say, it is made in two parts, which are insulated from one another, but bolted together. Two tubes are attached to this box, one on each side, each tube holding a carbon pencil about four inches long and $\frac{5}{8}$ of an inch in diameter. But the peculiarity of these carbons is, that one is hollow —that is to say, it is bored throughout its length, and an auxiliary carbon rod of less than a quarter of an inch in diameter slides freely in the tube thus provided. Another peculiarity which makes this form of lamp differ from all other regulators is the presence of a block of refractory material, which may be either a soft kind of Carrara marble, or an artificial stone resembling fire-clay.

Referring to the accompanying illustration, the lower carbon is solid, while the upper one has a hole through its length, as shown, and in this hole the sliding carbon rod is seen in section. There is an opening at one side of the marble block, and in the diagram it is shown how the rays of light proceed from that point.

The action of the lamp is as follows:—The two carbon rods are kept at a fixed distance from one another by the marble block, which, it is seen, is excavated at top and bottom for their reception. It is, therefore, evident, from what has already gone before, that no light can come from them while they are separated; but a sliding rod within the upper carbon furnishes the necessary initiatory touch. By the action of an electro-magnet, it automatically slides through the upper carbon and touches its opposite neighbour. Directly this is done, and the arc established, it is drawn back by the same agency. When the arc is established, it plays within the opening in the marble block, and, therefore, brings that block to a white heat.



The advantages of this form of lamp will be readily acknowledged by anyone who understands lantern work. To begin with, the light spot is small, and, unlike that afforded by many other electric regulators, it remains steady and in one position. The next point is that the somewhat cold glare common to arc lamps generally is modified by the presence of the refractory material, and the blue tone is changed to a somewhat warm light, more like that which is identified with the lime-light. Indeed, in one respect, we may compare this lamp to a lime jet, although, of course, it is far more brilliant; for the Carrara marble, under the influence of the intense heat to which it is subjected, must be actually turned into the same material which is rendered incandescent in the older fashioned light—viz., lime. And this forms rather a weak point in the newly devised lamp, because, when the marble is changed in that way and left idle, it becomes easily attacked by damp, and is apt to fall to pieces in a moist atmosphere. For this reason it is found essential, in some situations, to exchange the marble for a block of fire-clay, which is not subject in any way to atmospheric changes.

To sum up the advantages claimed for this form of regulator for projection purposes, we may note first its great illuminating power, the colour of the light, and its steadiness. The great simplicity of the apparatus is the next feature to be considered, for really there is no mechanism at all if we except the electro-magnet for connecting the smaller carbon and the two simple springs which keep the two larger carbons firmly pressed into the cavities provided for them. The economy of the lamp, in comparison with other forms of regulators, is great; for it is stated that two four-inch carbons will feed it continuously for more than fifty hours. And there is no waste in these carbons; they consume at the rate of one-sixteenth of an inch per hour, and leave no residue. As the carbon is sold at one shilling per foot, it will be seen that the expense of this material for each lamp is under one farthing per hour. The marble blocks last from twenty-five to thirty hours, but, as already indicated, the artificial fire-clay will last a great deal longer.

We hope soon to have the opportunity of trying this new form of arc lamp in the optical lantern. We understand that the heat from it is considerably less than that from the limelight—a fact which may, perhaps, be accounted for from the peculiar construction of the apparatus, which would cause a great deal of the heat to be absorbed. The lamp, we need hardly say, is also particularly suitable for lighthouse use, for mast-head lights for ships, for search lights, for naval and military purposes, and it may prove to be, from its great steadiness, one of the best forms of lamp that can be employed in the photographic studio. But the purpose of the present article is to show how well it is adapted for the work of projection, and, of course, under this head will also come its employment in photographic enlarging apparatus.

## CRYSTAL PALACE EXHIBITION.

### Second Notice.

As promised by the executive, the pictures were all in their places by last Friday; but, as the catalogue bore up to that day no corresponding numbers, it was rather difficult for the visitor to find the title of any particular picture except by a lucky guess. The system employed of distinguishing each alcove by a letter and number does not seem to be a very happy one, and is certainly an aggravation to those in search of any particular exhibit. For example, on page 26 of the catalogue we find the heading, "Alcove 4R," the next heading being, "Outside of Alcoves 5L and 5R (1)," followed by "Alcove 5L (Class A B)." Now no one—except, perhaps, that master of confusion, Bradshaw—can make out at a glance what all these reference figures and numbers signify. Surely, if the screens and alcoves were numbered like a street, with even figures on one side and odd numbers on the other, the method would be more easily understood by the non-mathematical mind.

The Art Division commences with Alcove A, and, so far as its contents are concerned, it might be called A1, for it holds the pictures sent in by Mr. Van der Weyde. Perhaps the most striking of these is the life-size and full-length picture of Miss Minnie Terry, and the very charming portrait of the Princess of Wales. Adjoining Alcove A we enter that marked 1L, and, although here we have a different type of photographic work, it is decidedly good of its kind. It consists of a number of views by Poulton, some of the best being those of fisher-folk taken at Whitby. Messrs. Byrne and Co., of Richmond, still keep up the high standard of work which they have taught us to expect from their studio, and show a number of life-size heads (taken direct), as well as an excellent selection from their "At Home" series. The next exhibit gives us a sample of process work in the shape of a number of beautiful photogravures by Boussod, Valadon, and Co. This firm also shows a number of copies of water-colour paintings reproduced in colour, and so well done that it is difficult to say where they differ from the original works. (This reminds us that in the apparatus section of the Exhibition there are shown certain photographs by "The Art Colour Photographic Company." We were assured by the attendant in charge that they were the direct product of the camera, and were not coloured by hand. We make no comment on this statement, but merely repeat it for the benefit of those who looked for an immediate result from M. Lippmann's experiments.)

The exhibit of Mr. E. T. F. Goodwin, of Upper Norwood, is of very high quality all through, platinotype portraits outnumbering those in silver, and we must give similar praise to the pictures shown by Mr. Pym, of Streatham. Mr. W. Crookes' (Edinburgh) collection calls for special mention, because it contains one of the most successful and realistic pictures which we have ever seen, and visitors to the Palace should be careful not to overlook it. Its title, "The Misses Curle," conveys little idea of its singular character, nor is it stated in the catalogue that it was taken by daylight combined with flash-light. The two ladies are talking in front of a fire-place, the light from which strikes their faces in a very natural manner.

Messrs. Cameron and Smith show many excellent copies of pictures by G. F. Watts, including "Love and Life," "Orpheus and Eurydice," &c., besides a number of good portraits. Next we have a peep into the past, by examining a loan collection of photographs taken by the late Mrs. Julia Margaret Cameron, who may be said to have been the first to recognise the necessity of observing the rules of art in photographic portraiture. These pictures having recently been exhibited in London, call for no special comment here. The Birmingham Photographic Society contribute to the Exhibition a collection of pictures of which the Midland city may truly be proud, for some of the gems of the show are among them. The work of Mr. W. J. Harrison is, of course, good, for he is one of our veteran workers. We must also give a word of praise to the pictures sent by Mr. A. W. Wills, who seems to be as much at home among the natives of Burma as he is when taking pictures in his orchid houses at home. Mr. J. H. Pickard has managed to get a marvellous picture from a simple bunch of grapes. Look at this, some of ye academicians, who paint year after year the same fruit studies with slight variation, and take a lesson, if not in colour, in delicate light and shade! But Mr. Karleese, with his beautiful scenes on the river Cole, and his frame of Warwickshire scenery, must take the palm from all who exhibit in this alcove, although he is run hard in subjects of the same kind by Mr. Leeson.

### List of Awards.

*Challenge Cup.*—Birmingham.

*Gold Medal for the Best Alcove.*—Van der Weyde.

*A Special Gold Medal* was awarded at request of judges to exhibit of Mr. Crooke, of Edinburgh.

*Silver Medal for Ladies.*—Miss Lilian Tomkinson.

*Silver Medal for Best Screen.*—W. W. Winter, of Derby.

*Bronze Medals.*—To Rev. Precentor Mann, J. E. Austin, F. W. Edwards, C. Whiting, R. Keene, Karl Greger, Lala Deen Dayal, A. S. Watson, H. Flather, Mesi, Bolas, & Co., W. L. Colls, J. Collier, W. M. Malby, R. H. Lord, H. Selby, A. R. Dresser, B. Karleese, J. H. Pickard, J. A. Hodge, C. C. Cole, and to F. W. Edwards.

#### LANTERN DIVISION.

*Bronze Medal* (Amateur).—Messrs. J. E. Austin, Beetham, Taverner, Dresser, and Dr. Thomas Morton.

*Bronze Medal* (Professional).—West & Son.

#### SCIENTIFIC.

*Bronze Medal.*—Stanley Kent.

*Judges.*—Valentine Blanchard, F. P. Cembrano, Frank Atkinson, F. Mason Good, P. H. Newman.

*Judges of Lantern Division.*—G. G. Baker-Cresswell, T. Freshwater, C. E. Gladstone, E. M. Nelson.

## TECHNICAL SCHOOLS FOR PHOTOGRAPHY.*

BY MAX JAFFE.

Lessons in the auxiliary sciences should follow on the drawing lessons, and also lessons in chemistry and physics as far as they concern photography and the photo-mechanical processes. However, this scientific instruction should not be conducted independently; it must be imparted with the general educational course, and by means of practice in the studios. In this stage of his school work the pupil must become acquainted with everything that he will have to use in practice, for this is the only manner in which the scientific instruction can be made of practical use to him. He must become familiar with the application of the utensils and apparatus that he will have to use subsequently; next, he must engage in practice in subordinate things, and take part in the necessary preparations for them; finally, he must be initiated into the sundry departments of the educational course in the easiest manner—that is, by practice.

This second part of the technical instruction, like the first, should occupy the pupil the entire day, and last for at least a year. Now follows the third part of this particular education, the practical instruction in photography and the photo-mechanical processes.

We now come to the question: In what manner is this to be accomplished? and come back to the earlier statement that the course of education is simply to follow the pattern which exists in the former apprenticeship; and means must here be provided for the scholar to gain experience of all the needs of real life. A scholar who has finished the course of the technical schools, and who had, up to the time of his leaving, only such problems to solve as were set for him by the masters, will be much disappointed by his entry into business practice, and feel strange in it, in the same way as we feel strange in those countries of which we have thoroughly learnt the language at school, but are not accustomed to its sound and form of expression.

Real life is only to be infused into the technical schools by means of productive work. The severe and constantly changing claims of practice form an education of a lively and invigorating kind, while the academical method of professional instruction will simply finish in monotony and pedantry.

There is scarcely a second profession in which the necessity of conducting education in the above-indicated manner appears so imperative as in ours. Let us compare another artistic profession; for instance, metal working. The scholar has an appointed exercise to perform—say, the fabrication of a candlestick in wrought iron in a prescribed style, from designs of his own drawing. If he has accomplished this commission satisfactorily, one can realise by this finished work that he is an accomplished draughtsman, and that he is well versed in knowledge of style, as well as that he has acquired a certain amount of experience in the treatment of wrought iron. It is entirely otherwise in our profession. There even the most interesting branches are seemingly easy of performance; indeed, anyone may have produced a good negative copy, or picture, or even a print, photo-lithograph, or a helio-engraving, without being able to say that he has penetrated into the spirit of the matter, and has a thorough command of every process.

In no other profession is it so valuable as in ours that one's knowledge be composed of the amount of experiences which each separate accident offers. This amount of experience is readily acquired by an amateur in self-chosen objects; but it is only acquired by a future professional man by dint of practice in the work which he intends to follow. To the uninitiated, and only half initiated, nothing appears easier than those processes on which the success of photography depends; the manner in which the multiplication takes place, and the development of the negative; especially in these days, when the sensitive plates can be bought ready for use. But, by closer consideration, it will be found—1st, that in spite of apparent easiness, success is only to be attained by long years of practice; 2nd, that for many purposes, especially the reproduction department, the gelatine plate gives insufficient results, therefore the old and difficult processes must be resorted to; 3rd, that proportionately little is done by the command of technique, but that much more is to be looked for from the knowledge of how to grasp the object to be photographed with the mind's eye, and how to use all accidental circumstances which would work together to favourably influence the result; that only in this many-sided combination of qualities the germ of the production of the negative is to be found,

In other professions there may be great difficulty in organising technical schools on the basis of production: in our profession the difficulty is not so great that it may not be surmounted with a good will. We have decided that the educational course shall be productive; it must, therefore, be established similarly to a professional business establishment. But it is not in any way intended to imply by this statement that the schools are to receive commissions from any quarter.

The final inspection of the professional instruction will always fall to the State. The educational management of each State has, in many branches of its business, a continual need of work in the photographic line, which need might be extended in many directions. These works would be furnished if possible by the technical schools. In this manner the schools could be supplied with the necessary funds for studying purposes, which would be otherwise unattainable.

Even the branch of portraiture could be used very productively for educational purposes; with it, a great deal could be done for medicinal, physiological, psychological, and other studies. Patterns or samples of portrait study might be made which might be sold at a certain fixed price like lesson-books. The landscape department could be made serviceable in manifold ways for studying purposes; for instance, for archæology, geology, geography, farming and husbandry, forestry, and the science of warfare.

This fact of the schools actually producing will have the following effect. The works issuing from them will have to undergo the severest criticism, and, therefore, they must continuously keep up with the prevailing spirit of the time. This circumstance will have this richly beneficial effect. Scholars who, through deficiency of talent or industry, cannot keep up with the course, can retire in due time, so as not to be a hindrance to the other more capable or more industrious scholars. On the other hand, it will necessitate the selection of only such men as teachers whose knowledge—in that department in which they teach—is fully up to the spirit of the time. It will also be indispensable that they possess in a very high degree capabilities to stimulate, educate, and cultivate the students. *(To be continued.)*

* Continued from page 300.

## THE PERMANENCY OF PHOTOGRAPHS.*

BY FR. WILDE.

It has been claimed for platinum prints that they are absolutely permanent. That reduced chloride of silver should not be equally permanent as chloride of platinum still remains to be proven. It is true that hyposulphite of soda does not come into play in fixing the platinotype, and all danger from that source is precluded. I have seen many clear and beautiful platinum prints, but also many which had turned very yellow. Platinum paper is notoriously unstable, and must be used fresh; if this is not done the result is doubtful, and the prints usually useless. Perhaps the poor specimens seen were the result of stale paper, or, possibly, the cause was that traces of muriatic acid remained in the paper. Last May I saw an exhibition of platinotypes, of universal excellence and clearness of tone, in a prominent photographic establishment. Several months later I again saw them in the same position. All had not kept equally well; a few had discoloured a little, but the majority were unmistakably yellow. Consequently, it is also requisite to exercise caution in the manipulation as well as in the selection of materials for platinotypes, if the prints are to remain without change. Such being the case, the much-vaunted platinum process has, as a matter of fact, no advantage over the silver print. Notwithstanding the beauty of the platinotype, which is acknowledged by photographers in general, the process is used by comparatively few. The cause for this may be that platinum paper is an expensive material, and the process requires much practice before the requisite experience is obtained which alone insures success. The failures are expensive, and cause much loss of time; and furthermore, specially prepared negatives are requisite to produce good results.

Now it is suggested to tone silver prints with platinum, and thus obtain prints with all the characteristics of platinotypes. Here the silver is replaced with platinum; accepted that it is true that platinum chloride gives more permanent prints than silver chloride, then by this method the substitution of platinum for silver would be easy and cheap; further, it does not bring into play a single process with which every photographer is not familiar. The process differs only in the substitution of a platinum for the gold bath. A platinum bath yields more and keeps longer than a gold bath. As a fact, the process gives excellent results, and is worthy of the attention of all photographers. In our own practice, we use a plain paper.

Platinum toning has been frequently broached, but the experiments usually resulted in measly prints if tried with albumen paper, or flat, grey prints on plain salted paper. The cause for these failures was that the baths for sensitising paper for platinum toning should contain ammoniated argentic nitrate. I never was in favour of such baths, as they do not keep, and are useless for albumenised paper. Still, it is convenient to have a bath which will answer for all papers. I made the trial with paper, sensitised on my regular bath for albumen (1·8) three minutes; then I fumed on both sides four to five minutes shortly before use. The result exceeded the expectation; quick printing, plucky, beautiful tones, brilliant high lights, with the richest scale of half-tones down to the deepest shadows. The paper used was a strong, heavy Steinbach, with a rough surface, notwithstanding which all the finest detail and modulations were present, which added greatly to the artistic effect. Before toning, the prints must be well washed until the water does not show the least trace of milkiness. They are then well drained, and placed in the platinum-chloride bath. They tone rapidly, after which they are placed in a strong bath of common salt; and from this into the fixing bath (hypo 1·6), in which they remain twenty-five to thirty minutes. After the fixing, I proceed as with silver prints. I place them in the salt baths until, according to the chewing test, there is no by-taste. These saline baths act well, and strengthen the tone of platinum as well as silver prints. Another matter which has a tendency to improve the prints is a rapid drying after a thorough washing. In mounting, a rapid drying by gentle heat also tends to act advantageously.

It is remarkable how indifferent the majority of photographers on the Continent are to the fuming of sensitised paper, in view of the great advantages to be gained with so little trouble and loss of time. Fumed papers are much more sensitive, and copy in less time than the plain. The prints are as strong with the use of a weak silver bath 1·12 to 1·16, as the unfumed sensitised on a concentrated bath 1·10 to 1·8. The prints on the former have a finer detail and shades in the half-tones, and details often lost come out here in all their beauty. Ready-sensitised paper only gives good results if fumed with ammonia. The prints then are equal to freshly sensitised paper. This paper is of great advantage to smaller photographic establishments, as it is possible to prepare a quantity of paper in advance. This saves time and trouble. The following formula has proved the most reliable in my experience; it seems to be of special trustworthiness, and deserves the attention of the practical photographer. The paper is floated for two or three minutes on a solution of—

| | |
|---|---|
| Nitrate of silver ... ... ... | 100 grams |
| Citric acid ... ... ... ... | 100 ,, |
| Water ... ... ... ... ... | 1,200 c.c. |
| Alcohol... ... ... ... ... | 100 ,, |

After each sheet has been sensitised, 10 c.c. of the following solution are added to the bath:—

| | |
|---|---|
| Nitrate of silver ... ... ... ... | 20 grams |
| Citric acid ... ... ... ... | 12 ,, |
| Water ... ... ... ... ... | 200 c.c. |
| Alcohol ... ... ... ... ... | 20 ,, |

When removed from the bath, the paper is drawn over a glass rod, and, after draining, placed with the sensitised surface on chemically pure blotting-paper. It is then covered on its back with a sheet of stout paper, and well and evenly wiped off by powerful rubbing and pressing. Finally it is dried spontaneously in the dark. If placed between preserving paper, it will keep for from six to eight weeks in summer, and for months in winter. The preserving paper consists of soft, very thick, unsized blotting-paper of white colour, which should be entirely free from wood, chemically pure, and saturated with carbonate of soda. It should be used in rolls of from five to six metres length, and kept, together with the sensitised paper, in pasteboard or tin boxes.

---

At a recent meeting of the Royal Meteorological Society, it was noted by Mr. F. J. Brodie, as one of the features of the past winter, that the number of foggy days in London was no less than twice the average.

The California Camera Club, says *Anthony's Bulletin*, gave a very interesting lantern exhibition during the last of March, on which occasion the views were entirely of picturesque English scenery, embracing many of the noted castles and ruins of the old country, and it was much enjoyed by all present.

* Concluded from page 265.

# Notes.

American genius is generally up to date, but although it has made all kinds of artificial things, from sham coffee berries to wooden nutmegs, it has as yet found the manufacture of an egg beyond its powers. If nature had kindly constructed eggs with solid interiors, the imitation thing would long ago have been achieved; but as it is, the Yankee inventor has in disgust to fall back upon nature.

As the photographer is still dependent to a large extent upon albumen for his prints, as the said albumen comes principally from eggs, and as eggs are impossible without the good offices of the hen, the following note with regard to the way in which our American friends propose to evade the tariff upon eggs should be of interest.

The suggestion is to feed the hens in Mexico on the cheap grain to be purchased there, and then to drive them into the United States before they have time to lay their eggs. In order to carry out this idea, it is intended to erect a long building, one half of which will find its termination in Mexico, and the other half in the United States. The obedient bipeds will feed and water at the Mexican end of the arrangement, and then, in order to escape the payment of duty, will run into the other end of the building, under the protection of the Stars and Stripes, and will there triumphantly lay their eggs.

Several photographers are advocating the use of celluloid as a material for the focussing screen, and as a substitute for glass. It certainly has advantages over the older material in the matter of weight and texture, but it is obviously limited to cameras of small size, owing to its liability to bulge out of shape with changes of temperature. It should be particularly valuable for photo-micrographic work, where a sharp focus is of so much importance, and where the coarse grain of glass makes good focussing so difficult.

Some very interesting photographs taken by Mr. Cecil V. Shadbolt, the son of a well-known photographic worker of a past generation, were projected upon the large lantern screen at the Crystal Palace on Monday last. They consisted of bird's-eye views of Beckenham, Thornton Heath, &c., taken from a balloon at various altitudes. As may be imagined, they had little artistic value, and were more like maps than pictures. The houses were hidden under their roofs, and formed, with their gardens, a kind of patchwork appearance upon the landscape. The altitude from which these pictures were taken averaged about 1,500 feet. We are of opinion that such pictures would be more interesting if taken much nearer to the earth, so that living beings could be depicted from such a novel point of view.

Dr. Charles M. Cresson, of Philadelphia, is credited with having taken the portrait of the much dreaded bacillus which is supposed to be associated with typhoid. The tiny organism was captured from suspected drinking water by agitating the liquid, and then decanting it into a funnel-like vessel terminating below in a very fine opening furnished with a tap. When the water in this vessel had been at rest for some time, a single drop was permitted to exude from the lower opening, and this was at once placed under a microscope. The typhoid imp is not unlike a dumb-bell in shape. By means of the camera its image has been enlarged to about 3,500 diameters.

"Ceramic photography made easy," might be the title of the process lately described and demonstrated before the French Photographic Society by M. Raymond. His process is briefly this: He prepares a collotype plate, and rolls it up in the usual manner with fatty ink, but this ink has been previously charged with vitrifiable colours. A proof is then taken upon paper charged with a soluble substratum, so that when the image has been transferred to the surface to be decorated, the paper can be stripped off, and the article fired in the ordinary way. It will, therefore, be seen that the process is analogous to the common method of decorating china ware, with the substitution of a photographic original for that supplied from a cut block.

Many old photographic ideas are continually cropping up as new things, and it is not uncommon for one of these to form the subject of a solemn communication to some society or other, and to give rise to grave discussion. The older hands smile sometimes when they see reports of such doings, but do not take the trouble to point out how ancient they are. That the taking of lightning flashes is no new thing—although often regarded as being a novel application of photography—is proved by a correspondent of the *Photo. Archiv*, who quotes from a paragraph published in 1864 at Leipsic. It runs as follows:—"Gunther thus conceived the idea of photographing lightning, and one night was, with Prof. Dove, observing a storm at the Berlin Observatory. The sky was favourable. Gunther prepared the plate, exposed it to the dark heavens, and closed the slide after a flash of lightning which crossed the field of view. The flash was taken. What a triumph for photography, and also for science, to succeed in copying, after nature, a flash of lightning!"

The Glasgow and West of Scotland Photographic Association are certainly taking time by the forelock in issuing the prospectus of an exhibition which will not open its doors until September. But they are doubtless right in doing so, for they hope, they say, to make this the largest and most interesting exhibition of photography which has yet been held in the West of Scotland, and with this view they have arranged that the pictures shall be hung in the finest hall for exhibition purposes in Glasgow. We learn that they have many promises of support from both professionals and amateurs. Particulars may be obtained of the hon. secretary, W. Goodwin, 3, Lynedoch Street, Glasgow.

A very perfect series of instantaneous photographs of the attitudes in fencing appeared in *La Nature* for last week. The photographs are eighteen in number, and were obtained by M. Marey's photo-chronographic apparatus at intervals of $\frac{1}{20}$th of a second on a sensitive pellicle moving between each picture, and stopping during the time of exposure, which was $\frac{1}{1000}$th part of a second. English athletes would like to see representations of boxing figured in a similar fashion.

An enterprising journal which is bitten by the present mania for giving portraits of everybody, from the somebodies down to the nobodies, must be prepared for sarcastic criticism. One newspaper, commenting upon the likenesses given in a contemporary of the members of the Labour Commission, professes to find, according to its "recognition of the portraits," that it now consists of Mr. P. T. Barnum, General Booth, the Siamese Twins, Sir John Astley, Mr. J. L. Toole, and others. It then kindly adds: "We were under the impression that some of these were no longer in active service, but 'the apparatus can't lie,' and there are the pictures." Photographers have, years and years ago, discovered that no two critics ever agree as to the resemblance of a portrait to the original. The enterprising journal referred to above may take comfort from the fact.

---

Mr. Carey Lea is still actively pursuing his researches into the nature of the various silver compounds. An article on allotropic silver appears in the April number of the *Philosophical Magazine*, taken from an advance proof sent by the author. Mr. Carey Lea points out that he dealt with the gold-coloured form of allotropic silver in a paper already published. In the present article he considers the relations existing between the allotropic forms of silver taken generally, and silver as it exists in its compounds, more especially in the silver haloids, and he has come to the conclusion that there is reasonable ground for supposing that in the latter allotropic silver may so exist. In a future paper he proposes to treat of the blue form in its soluble and insoluble varieties.

---

The Manchester Amateur Photographic Society displays considerable energy, and seems to be highly popular. It boasts of a journal which is published quarterly, from which we learn that the library has grown to such an extent that the librarian "requires more shelving." This is a very healthy sign.

---

The same society has tried the "Question Box" system, but has not found it to answer. The plan adopted was somewhat different from that in vogue in other societies. The old idea was that a "Question Box" is an excellent substitute for a paper when the latter is not forthcoming. If the experience of the old South London Photographic Society be any guide as to what has happened elsewhere, it often turned out the box was a delusion, for on more than one occasion when it was resorted to it was found that the "cupboard was bare."

---

The Manchester Society's box, on the other hand, was intended for the reception of questions by persons in want of information, and the answers were given by the members at the meetings when the box was opened. It has been found, however, that the answers were of necessity off-hand, and that sometimes no reply was given at all. Henceforward, members wanting information must send their queries to the secretary at least a week prior to the monthly meeting. Such a "Question" or "Information Box," as it ought to be called, is decidedly a good idea. There are many beginners too timid to expose their ignorance *viva voce* who would gladly send in their questions on paper.

In spite of the ingenious invention of a Plymouth undertaker described a few weeks ago in the *Undertaker's Journal*, which not only exhibits portraits of the deceased persons on their gravestones, but also records the visits of those friends who chose to leave their cards, we doubt whether the practice of attaching photographs to gravestones will ever become general. Most people, after they have gone through the melancholy duty of the funeral service, are apt to shun graveyards and cemeteries. Still it may be that undertakers, in view of a reform in funerals which would cut down "extras" to nothing, and considerably reduce profits, will take up photography as a substitute, and, with that persuasiveness which is so effective in the time of woe, induce people to have photographic adjuncts placed on the graves of their friends and relatives.

---

Already an example has been set by a firm of Canadian photographers, whose advertisement in the *Hamilton Evening Times* is so unique that we cannot forbear quoting it. "Green Bros., John St.," it says, "are the only undertakers in the city who take photos of deceased people. The eyes are opened, and taken as natural as if alive. By calling at office such portraits can be seen." Here is, indeed, enterprise. We are inclined to think the photographic profession would not mind handing over all the *post mortems* to the undertakers, for photographing a corpse is an operation from which most shrink. Besides, what photographer would have a chance against an undertaker who can produce portraits in which "the eyes are opened, and taken as natural as if alive"? As we have not seen "such portraits," perhaps it would be unfair to pronounce judgment on them; but, at present, it looks as if the ingenuity of "Green Bros." is likely to add a new terror to death.

---

What's in a name? Not much, perhaps, but, at least, it should not be misleading. The View-Finders' Club is an active photographic association, which has its habitat in Edinburgh. At the first blink, it would seem as if the object of the Club had to do with that useful little attachment without which the detective camera is incomplete; but this not the case. The Club interprets the word "view-finder" in a liberal sense, for its aim is "the education of its members in art principles, and the criticism of their work." It is a moot point whether the title is a happy one or not.

---

As might have been expected, the experiment tried by the English Art Club of having photographs of the pictures on sale in the Dudley Gallery, where the collection is now on view, has been much appreciated by the visitors, who have not been slow in buying copies. As the photographs are the work of that experienced operator in this branch of photography, Mr. F. Hollyer, their excellence is guaranteed.

---

The gentleman who wrote the *Globe* notice of the Crystal Palace Photographic Exhibition has not kept himself well posted up in photographic history. He says gravely that "Mrs. Cameron sends" some of her well-known specimens of artistic photography, and is evidently unaware that this lady has been dead many years.

## THE SECOND TRIENNIAL EXHIBITION AT GLOUCESTER.

The Gloucestershire Photographic Society is again to be congratulated on the complete success which has crowned the efforts of its executive. The lofty and extremely well-lit room furnishes an admirable home for the pictures, but was not available for use until Saturday, so all the work had to be crowded into two days; the brilliant effect, however, which greeted the eye on entering the gallery on the opening night conclusively demonstrated what could be done by the well-directed efforts of a few really earnest workers.

The formal proceedings attendant upon the opening were delightfully brief. The president of the Gloucestershire Science and Art Society, Mr. W. C. Lucy, in a few well-chosen words, declared the exhibition open, and after a few remarks from the Mayor of Gloucester, who told the audience that he was a photographer forty years ago, and also from the president, Mr. Walter B. Wood, the guests were invited to partake of refreshment before settling down to enjoy what was really the great feature of the evening, viz., a most delightful lecture on Iceland, illustrated by a remarkably fine series of slides recently executed by the lecturer, Mr. Paul Lange, who, in a bright and witty manner, told all the discomforts and perils that awaited him at every turn during the prosecution of his photographic labours. The audience had every reason to be delighted, for it was, without doubt, one of the brightest lectures ever delivered. Mr. Lange is a born lecturer. He was in touch with his audience from the moment when he opened his mouth, and held them under a delightful spell to the end.

This mode of opening an exhibition is a most agreeable departure from older methods, where torrents of platitudes run their resistless course, and we earnestly recommend promoters of exhibitions to copy Gloucester.

The judges were Messrs. H. P. Robinson, Valentine Blanchard, and Edward Brightman, and the following are the awards made by them:—

Class 1—*Portraits, Professional.*—Silver medal, W. J. Byrne; bronze, W. W. Winter.

Class 2—*Portraits, Amateur.*—Bronze medals, Shapoor N. Bhedwar and W. J. Jenkins.

Class 3—*Landscape, Professional.*—Silver medal, J. P. Gibson; bronze, A. Hendrey.

Class 4—*Landscape, Amateur, under 8½ by 6½.*—Silver medal, Karl Greger; bronze, Martin J. Harding.

Class 5—*Landscape, Amateur, 8½ by 6½ and above.*—Silver medal, J. E. Austin; bronze, E. Lloyd Edwards; extra bronze, W. H. Banks.

Class 6—*Instantaneous.*—Silver medal, Charles Reid; bronze, Lyddell Sawyer.

Class 7—*Hand-Camera Work, Objects in Motion.*—Silver medal, J. M. Nicholson; bronze, J. White.

Class 8—*Architecture, under 8½ by 6½ (Series of 3).*—Silver medal, Ernest Beck; bronze, C. Court Cole.

Class 9—*Architecture, 8½ by 6½ and above (Series of 3).*—Silver medal, W. J. Byrne; bronze, C. Court Cole.

Class 10—*Genre or Figure Picture.*—Silver medal, Lyddell Sawyer; extra silver, Shapoor N. Bhedwar; bronze, R. H. Lord.

Class 11—*Enlargements (not Portrait), Amateur.*—Silver medal, F. H. Worsley-Benison (subject to confirmation of Condition 5); bronze, W. H. Kitchen; extra bronze, C. W. Huson.

Class 12—*Enlargements (not Portrait) Professional.*—Bronze medal, Hedges and Sons.

Class 13—*Lantern Slides, Professional.*—Silver medal, George E. Thompson; bronze, Priestley and Sons.

Class 14—*Lantern Slides, Amateur.*—Silver medal, J. E. Austin; bronze, Edgar G. Lee; extra bronze, W. C. Beetham and Major Lysaght.

Class 15—*Scientific.*—Bronze medal, Cecil V. Shadbolt.

Class 17—*Special.*—Bronze medal, Maurice Bucquet.

The entries in the lantern competition were so numerous that extra medals were awarded. Serious criticism was not possible at the *conversazione*, but on looking at the general effect by daylight one could not help feeling that the very large number of small pictures, nearly all of the grey tint of platinum pictures, gave an undoubtedly monotonous character to the general effect, and it was only when the pictures were inspected one by one that this feeling disappeared, for it must be admitted that the average of excellence has risen enormously since the last exhibition three years ago. This disappointing effect is largely due to the division of the pictures into classes, and the consequent necessity of keeping the pictures in each class together, as far as possible. The members of the Society have adorned the lantern stand with some of their pictures, and, with a most commendable modesty, have not entered them for competition. On this screen are some admirable architectural bits (Mr. W. B. Wood), and among them the celebrated Norman doorway at Ludlow Castle.

Another screen is entirely filled by the splendid series of the Academicians, by Ralph W. Robinson; many of these are so well-known that they do not need further comment. They are marked "not for competition." The lecturer's rostrum is well covered by the well-known work of Mr. H. P. Robinson—one of the judges—and these also are marked as out of the running.

Mr. W. J. Byrne has surpassed himself in some portraits of children. Several of them are extremely simple in treatment, for there are no accessories to distract attention. They have the grace of unconscious pose, and the large-eyed, trustful innocence expressed by two of them make them no longer children, but angels. Sir Joshua Reynolds, had he been there, would have been envious.

Mr. Vandyke's powerful portrait studies are well-known, and so also is the work of Mr. W. W. Winter. The group of two ladies in white dresses, with its powerful light and shade, shows well in this gallery, but, being nearer the eye, the touching shows too palpably. Why do it, Mr. Winter? The picture is so fine that surely it would be better without this evident sophistication. There is a little picture of mother and child by this gentleman that is simply delightful. A roguish child, evidently a great pet, is lovingly squeezing the cheek of the fond, well-satisfied mother. During the run of the Exhibition, we predict that several "mothers' meetings" will be held in front of this picture.

Window and Groves' pictures are well known. There is one, however, of Mr. Gordon Craig in "Ravenswood" so broad in effect, and so powerful in light and shade, as to stand quite out from the frame. The beautiful mobile mouth, and the bright flashing eyes, make this by far the best of the many portraits done of this remarkably handsome young man. Mr. W. J. Jenkins has made a very good commencement in his portraits called "Old Heads" and "Young Heads." They are taken with a single lens, and the eye, in consequence, is not distracted by the painful sharpness only too apparent in a large proportion of the work of the professional photographer. Mr. Jenkins is an amateur, and is on the right track. Go in and win, Mr. Jenkins.

Mr. J. P. Gibson has surpassed himself at this Exhibition. Several of his larger pictures are well known; but "A River-side Road" is one of the most perfect landscapes ever done by photography. A river threads its way between hills and loses itself behind a clump of trees on the right. The whole of the picture is made up of tender greys, except some strongly accentuated dark stones in the bed of the river in the foreground. Without these aids to effect, the picture would be regarded by many as tame and rather flat; but with them the picture is perfect. Every object takes its place, and there is harmony everywhere. Another picture, of larger size, is worthy of notice. It is made up of slender materials, but they are used in the most artistic manner. Only a steep, sunlit bank on the right, and a road at its base. A group of children are playing in the foreground, and, like the stones in the last picture, give force to the whole. A bank of white, luminous clouds completes the composition, for it supports and, at the same time, explains the sunshine that dances here and there through the picture. One of its brethren darkens the extreme foreground, but does not obscure the middle distance, where it has full play. This picture is an admirable illustration of the use of clouds when rightly employed.

There are some very fine interiors by Mr. W. J. Byrne, but one of them, "The Drawing-Room at Crewe Hall," is, technically, one of the most perfect, if not the most perfect, interior ever produced. There is detail in the deepest shadow; indeed, there is delicacy of an unusually rare kind, and yet all the force necessary to make a perfect result. What more can be said? The library as a photograph is equally good, but the formality of the carpet makes it not quite so artistic. Keene's interiors are as good as ever, but they are so well known that they do not require more to be said about them.

## WINTER PHOTOGRAPHY.*

BY ERNEST H. JACOB, M.D.

Winter photography, so far as one can judge from exhibitions of lantern slides and pictures, has suffered far too great neglect. The reasons are strong, both artistic and scientific, why the camera should find frequent use in the winter months even more than in summer. Setting aside the slight inconveniences and personal discomforts of operating in cold and windy weather, with benumbed fingers which will hardly work the focussing screw, we find ourselves in winter confronted with an almost monochrome picture, with its well-defined forms of tree and cloud far more perfectly fitted for photographic representation than the summer landscape with its heavy greens, so difficult to render except by special methods. Artistically, the face of nature in its winter garb has a quiet beauty of its own quite as worthy of being pictured as the more vivid colouring of sunnier days. Winter, moreover, brings us certain special forms peculiarly adapted to the photographer; among these may be mentioned:—

1. Buildings which, in the summer months, are largely obscured by trees. There are many of these, and the lover of architectural detail will frequently have to leave unpictured on his holiday tour forms of sculptured beauty which can only be fixed when the falling of the leaf reveals them.

2. Snow scenes. These are generally considered fit objects for photography, but it is difficult to catch the right moment for depicting the effect. On the whole, perhaps, certain kinds of hoar-frost on shrubs or hedges are the most effective forms to photograph.

3. During the time of snow, interiors, as a rule, are better lighted than even during the summer season. Many a dark roof of cathedral or ancient building can only be well photographed when lighted by the reflection from the snow outside.

4. On the whole, however, the most interesting objects to photograph in winter are trees. In summer, a tree is a mass of foliage, beautiful to the eye, but unsatisfactory to picture by chemical means. When the dress of green has fallen, we seem to see the real tree, with its character more firmly defined, and its delicacy or strength not only more easily recognised by the eye, but in such a tone as to enable a picture, exact in the delineation of the finest twig, no less than the strongest bough, to be fixed by the plate; a picture, moreover, compared with which the most delicate brush-work seems a misty array of meaningless scratches. There are a few trees, it is true, rather ugly in their winter bareness. A row of poplars and a clipped hawthorn hedge one need not spend much time in studying; but an oak, an elm, or a group of birches, form truly admirable subjects for pictures. The larger type of forest trees can be studied in the numerous parks which abound in England. Some very fine specimens are to be found in Studley Park, near Ripon (mostly oaks, elms, and Norwegian pines), and in Nuneham Park, near Oxford, where elms and conifers are exceptionally fine. The study of tree forms is valuable not only from an artistic but from the botanical standpoint, and photographs of trees, both in their summer and winter state, should form part of every botanical institute, or school where botany forms part of the curriculum. The study is a most engrossing one, and the photographer who takes it up will find a new pleasure added to his pursuit.

5. It need hardly be mentioned that cliff and coast scenes are no less interesting in winter than in summer, unless the "common objects of the sea-shore" as illustrated by the *genus homo* be the only things sought for; while skies and breaking waves are infinitely finer in the colder months, and in early spring the light is quite good enough for instantaneous views of wave forms.

Lastly, the sombre monochrome of the winter landscape is far more worth picturing than a large number of the objects which crowd our exhibitions. A woodland scene, when lit up by the brilliancy of the silver birch, and enriched by the lace-like delicacy of its drooping branches, forms a picture not only beautiful in itself, but capable of being transferred intact to paper or glass, with its lines as perfect as in nature, and its "values" in absolute accuracy.

[The paper was accompanied by a number of lantern slides illustrating the various points touched upon, including a series of trees mostly photographed in Nuneham and Studley Parks.]

* Abstract of paper read before the Leeds Photographic Society.

Photographic Club.—Wednesday, April 29th, will be the last lantern evening of the season. On May 6th, the subject for discussion will be "Outfits for Landscape Work." Outing on Saturday next, April 25th, to Brentford; train from Broad Street (*via* Kew Bridge) at 2.25.

To Make a Dead-Black Polish on Brass.—For microscopes, &c., mix one ounce of nitrate of silver in a dish with twenty ounces of distilled water. In another dish mix one ounce of nitrate of copper with twenty ounces of distilled water. Mix the two solutions together, dip the brass in the liquid, remove the brass, and heat in an oven until the desired degree of black is obtained.

## ARCHÆOLOGICAL PHOTOGRAPHY.

### Ancient Coast Oratories.

Our good forefathers, although professing a creed which it has been the custom for three centuries and a half for some of us to "protest" against, nevertheless possessed a very large share of sincere piety and true Christian charity, as is evidenced by the grand and lasting memorials and imperishable records which they have left behind them in our glorious cathedrals, hundreds of monasteries, churches, chapels, chantries, oratories, and other religious works. It has been said that the piety and religious fervour of our ancestors was merely formal. Possibly; but if so it is very clear that this dry formality took a most substantial, useful, and unselfish turn when it could expend its energies, and its treasure, in rearing, in a genuine religious spirit, such glorious works as those just mentioned purely "ad majorem Dei gloriam"; and if these high-souled men and women reared the vast cathedral for the country at large, the convent for the special community, the church for the particular parish, and the chapel and chantry for family use or private devotion, their large-hearted goodness went farther still. Never losing sight of the significant fact that this is a maritime country, and that it always possessed a commerce, even from very early times, which so increased in the middle ages that many merchant princes arose, notably in the city of London—Whittington, Gresham, Crosby, Hatton, and others—and remembering that foreign commerce depends entirely on ships, and ships entirely on sailors, these thoughtful and generous people founded, on different parts of the coast, close to the sea, very small oratories, the merest remains of but one or two of which yet exist. As these were not intended for the assembling of congregations, they were just large enough to contain an altar, with its ornaments and crucifix, an effigy of a saint (possibly St. Clement, the patron of sailors), and perhaps little else. Here a priest was engaged to say mass, perhaps two or three times a week, or even oftener, expressly for the double purpose of (1) praying for rest for the souls of those belonging to the place or town where the oratory was situated, who had lost their lives at sea; and (2) for the safety and success of the living then sailing the sea in pursuance of their duties—an idea beautiful in itself, and embodying true Christian charity. One of the largest and most celebrated of these oratories was situated at "Bradstayer," or "Braidestowe," meaning "the broad place," now called Broadstairs, on the east coast of Kent. This little chapel was dedicated to the Holy Virgin, under the name of "Our Lady of Pity," or St. Mary de Braidestowe." In it was a statue of the Patroness, which was held in such extreme veneration that all ships, as they passed the spot, lowered their topsails as a mark of reverent salutation, for it must be remembered that the Blessed Virgin was always regarded with profound love and reverence by sailors and fishermen, and constantly addressed as the "Star of the Sea."

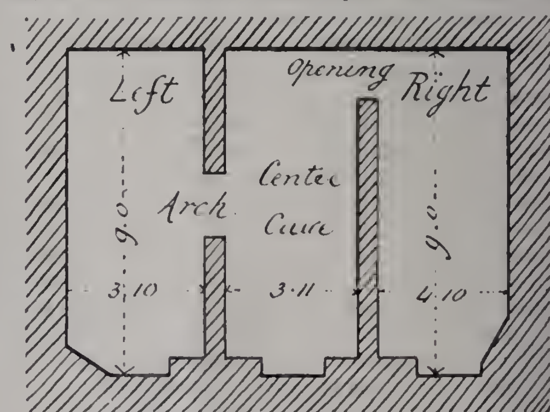
Such oratories also existed at Reculvers, Dover, Whitby, and in other places, though all have now disappeared. They are still, we believe, frequently to be met with on the Continent.

It may not, perhaps, be generally known that the great corporation of "Trinity House," on Tower Hill, which takes charge of and regulates all matters connected with lighthouses, light-ships, buoys, beacons, and other matters connected with the maritime interest on the coasts of England and Wales, was originally founded in the reign of Henry VII. as a simple religious "Guild," the Brethren of which bound themselves to pray for the souls of sailors lost at sea, for the safety of those on the verge of shipwreck, and the lives of sailors then following their duties. It was called the "Guild or Brotherhood of the Holy and undivided Trinity of Deptford, Strand, and St. Clement."

Accompanying this article is an illustration of what we believe to be one of these veritable and undoubted oratories, and known by the name of the "Minnis Rock" (from "Meuys"—Saxon—steep), and which may still be seen

just a little to the north of the Old Town of Hastings, and close to High Wickham, in the western face of the East Hill, which, at its greatest elevation, rises to the height of about 250 feet above the sea level.

The "Minnis Rock Hermitage," as it is sometimes called, consists of three square-headed openings or arches, all of the same height, rudely cut in the face of a huge mass of rock projecting from the side of the hill, and about 12ft. or 15ft. high, and 25ft. or 30ft. broad. The cave is divided into three separate chambers of nearly equal size, as shown in the annexed plan, the centre com-




municating with the two side ones by rudely cut openings; but they are all three now nearly filled up with earth and rubbish, and only their heads are visible above ground. The dimensions of what, at present, can be seen may be taken as follows:—

| | Height above ground. | Breadth. | Depth. |
|---|---|---|---|
| Centre | 2ft. 0ins. ... | 3ft. 11ins. | All about 9ft. |
| Left | 2ft. 2ins. ... | 3ft. 10ins. | |
| Right | 3ft. 1in. ... | 4ft. 10ins. | |

Nothing whatever seems to be known of this curious relic of the deep religious feeling of our forefathers of remote antiquity, and it is very much to be regretted that nobody—not even the freeholder—seems to take the smallest interest in the place. It has been called, as already stated, a hermitage—the supposed abode of a hermit—but this again is most unlikely, for the cave, situated close to the town and church, and just above the old Roman road (now the London Road, leading into Hastings), would be very much too public; as it is well known that hermits invariably sought and preferred quiet and privacy, and would hardly have selected so very exposed a spot as this.

About a century ago the cave was open, and it was said to have been the residence of an aged couple, who were paupers and homeless. After that it was used as a cow-shed; and gradually, from utter neglect and indifference of those who ought to have known better, it has become the ruin we see it, and choked nearly to the roof with dirt and rubbish.

When the interior of this cave was last examined, it was described as having an undoubted ecclesiastical appearance, though very small. Opposite the centre door, and therefore due east, is a slab of stone, which may have once supported an altar, and a cross is said to be cut on the wall above, and on one side is a niche, and below that a recess, which has been called a "fire-place," but it is far more likely that it served for an aumbrey. Now, taking all these circumstances in consideration, there can be little doubt that was this really an oratory, one of those, in fact, where mass was regularly recited for those at sea, dead or alive, such as we have already described. Everything about the cave points to this; its general appearance, the slab, the cross, the niche, the side chambers, which possibly might have served as a sacristry, or even a temporary lodging for the priest—the openings being, of course, boarded up—all tend to confirm the opinion as to its original intention and use. It is much to be lamented that this, the last of these oratories now existing in England, and even yet in sufficient preservation to exhibit its dimensions, is not again opened and cleaned, and thus made an object of interest and curiosity to the public; but where no one, not even the fortunate owner, feels the least sympathy for this relic of the piety and charity of our forefathers, of course nothing will ever be done, unless the "Society for the Preservation of Ancient Monuments" could be induced to interfere for the saving from desecration and decay of so interesting and peculiar a religious relic.

In the immediate neighbourhood of the "Minnis Rock," a few hundred yards to the south of it, is to be found another antiquarian curiosity, and, at the same time, an antiquarian puzzle. On the western face of the East Hill, a little below its summit, a portion of the ground has been scarped so as to present a perpendicular surface of flat rock, about 16 ft. high and 30 ft. broad. On this will be seen, carefully measured and neatly cut, three Gothic arches with early English mouldings, having their centres painted black, and called by the people the "Three Black Arches." They are shown in fig. 3, and here comes the very peculiar puzzle: There is neither grotto, cave, nor opening of any sort whatever behind these arches; they are merely chiselled on the flat surface of the solid rock, as can be distinctly seen by certain geological appearances. The centre is higher than the two side arches, and their dimensions may be thus roughly stated: the centre about 11 ft. high by 7 ft. broad, whilst the two others are about 7 ft. high by 4 ft. broad. As considerable care and much trouble must have been taken in measuring and carving out these arches, so closely resembling the doors of a church, the question at once arises, if the work was to lead to no further result, *Cui bono?* Why take all this trouble for absolutely no object or intention whatever? Nothing is known on the spot, and the two or three idle, stupid tales told by the people carry immediate discredit on their very surface. As it is far from likely that any sane person would take all this trouble for no possible use or object, it is quite reasonable to suppose that these

ecclesiastical-looking arches were begun, centuries ago, for an undoubted purpose, and that purpose a religious one—most probably the formation of a chapel or oratory, such as the "Minnis Rock"; but that the work was suddenly stopped—as many another has been before to-day—possibly by the death of the designer, or, maybe, from want of funds, or other cause, which we shall now never know; and so the work was left much as we now find it, although severely injured by time, neglect, and indifference, like its neighbour, the "Minnis Rock"; and it is very much to be regretted that two such interesting relics of the piety of a long by-gone age should fail to rouse the smallest sympathy or feeling amongst the inhabitants of Hastings. But we suppose the real fact is that, as nothing is to be *gained* or *made* out of these curious relics, they are simply treated with utter neglect and indifference, and suffered to go to slow decay and ultimate ruin.

---

Photographic Society of Great Britain.—April 28th—Discussion on "Animal Photography"; Messrs. T. J. Bright, H. Dixon & Son, A. R. Dresser, F. Haes, L. Medland, W. Wainwright, and F. York have promised to exhibit prints or lantern slides. May 12th—M. Leon Vidal will read a paper on "Photographic Methods of Obtaining Polychromatic Impressions." May 26th—Discussion on the "Influence of Development on Gradation." June 9th—Mr. L. Warnerke will read a paper on "A New Sensitometer."

"The secret of a successful photographer," said one who knows, "is in making pictures which flatter the subject. No person wishes to have a picture which accurately represents him as he appears to others in the street. Each man or woman has a certain mental impression of his or her appearance; it may, and probably does differ from the reality, but in order to please him his photograph must not show the crook in his nose or the slight in his eye."—*Photographic Times.*

## THE PHOTOGRAPHIC LENS.

BY THOS. R. DALLMEYER, F.R.A.S.

In complying with the editor's request to contribute a short article to the first number of *The Optician*, I have chosen a general subject as a heading, although the particular remarks will be confined to the photographic lens. The value of illustrations to give a general idea of instruments is no doubt great, and if the illustrations be accurately drawn to scale, of course they will be of still greater value to a buyer. In most optical instruments, however, something more thau the exterior appearance of an instrument is requisite, and further, as year by year we seem to have a more and more initiated public, the more necessary does it become that we should assist, by every means in our power, in furnishing the fullest information for intending purchasers. I therefore hope that the suggestion for the necessity of accuracy in technical descriptions may be followed by others who are devoting particular attention to one brauch or another of the optical trade. With regard to the photographic lens, nearly as much as is possible has been done in this direction, but having thought of one or two useful additions, I have deemed it worth while to mention them. The utility of one was suggested by a letter from the secretary of a provincial camera club, in which he asked what was the meaning of a lens being described as a particular *dimension of plate* given in connection with the type of lens: *e.g.*, what does an $8\frac{1}{2}$ by $6\frac{1}{2}$ rapid rectilinear mean?—the point of the question being what was the full meauing of $8\frac{1}{2}$ by $6\frac{1}{2}$. With the particulars as set forth iu opticiaus' catalogues, at present only one addition is necessary to fully explain the meaning, and that is that the full diagonal of the circle of illuminatiou covered by the lens should be also furnished. Some types of lenses will only cover very little more than the size of plate for which they are advertised, while other forms will at any rate illuminate and, if well stopped down, cover much larger plates. In addition to furnishing the linear dimension of the circle of illumination covered, it is ouly necessary to tabulate and remember the linear dimension of the diagonal of any aud every current size of plate.

| | | | | | |
|---|---|---|---|---|---|
| Diagonal of | $3\frac{1}{4} \times 3\frac{1}{4} = 4{\cdot}58$ | inches, | or under | $4\frac{3}{4}$ | inches. |
| ,, | $4\frac{1}{4} \times 3\frac{1}{4} = 5{\cdot}30$ | ,, | ,, | $5\frac{1}{3}$ | ,, |
| ,, | $5 \times 4 = 6{\cdot}4$ | ,, | ,, | $6\frac{1}{2}$ | ,, |
| ,, | $6\frac{1}{2} \times 4\frac{3}{4} = 8{\cdot}06$ | ,, | ,, | $8\frac{1}{4}$ | ,, |
| ,, | $8\frac{1}{2} \times 6\frac{1}{2} = 10{\cdot}67$ | ,, | ,, | $10\frac{3}{4}$ | ,, |
| ,, | $10 \times 8 = 12{\cdot}80$ | ,, | ,, | 13 | ,, |
| ,, | $12 \times 10 = 15{\cdot}62$ | ,, | ,, | $15\frac{3}{4}$ | ,, |

Now take, for example, a lens advertised to cover a $5 \times 4$ plate; if the minimum linear dimension of the diagonal covered by the lens is greater thau that of the diagonal of any larger size of plate, it is understood at once that the lens will cover this larger plate if sufficiently stopped down. Further, there is conveyed by this information an approximate idea of how much the sliding front may be moved (without cutting off the corners) either up or down, or sideways, when working on a particular plate. It can always be moved right and left (or up and down) from the centre *at least* half the difference between the diagonal of the full circle covered by the lens, and the diagonal of the plate employed. If it is found that the covering powers of the full diagonal of the lens in question only just correspond with the diagonal of the plate, it is evident that it will be unsafe to use such a lens other thau in a central position as regards the plate. It may frequently occur that a photographer may wish to employ a lens of a certain focus upon a given size of plate, but he finds, on looking through a catalogue, that there is no lens, as advertised, distinctly in accord with his requirements. Of course he knows that if the lens of the requisite focus covers a *larger* plate than that for which he intends to employ it, it will cover the smaller plate, and iu that respect the present technical description of the lens is sufficient. Now, if the optician furuished the information suggested, noting that a lens constructed for, say, an $8\frac{1}{2} \times 6\frac{1}{2}$ plate, diagonal of which, $10\frac{3}{4}$ inches, would cover a circle of illumination linear dimension 16 inches, the photographer can see at once that this linear dimension is greater than the diagonal of a $12 \times 10$ plate, and hence he knows that by stopping the lens down, he is in possession of an iustrument that will, if occasion occurs, cover a plate so much larger, and that on using this lens on its owu plate, there is considerable latitude for movement of the sliding front; it may be moved *at least* $2\frac{1}{2}$ inches longitudinally or vertically from the ceutral position.

A short time ago there appeared in the PHOTOGRAPHIC NEWS a somewhat similar suggestion from Dr. Vogel, viz., that opticians should express the covering power, or the linear dimension of the circle of illumination included, in terms of the equivalent focus. This, of course, furnishes the same information as that suggested, although I have offered it iu a rather more practical form.

The diagonals of current plates would be very shortly as familiar as the dimensions of the current plates themselves, and the column indicative of the liuear dimensions of the circle of illumination covered would then prove a very useful addition for the purpose suggested.

To give a proper technical description, then, of a photographic lcus, it is necessary to furnish the following information accurately:—

1. General information on the type of lens, which should include:—(*a*) The form and number of combinations, and the manner of mounting—illustrations here are useful; (*b*) the intensity of the full working aperture of the series; (*c*) the approximate angle included by the series on the longer side of the plate; (*d*) the concise explanation of the system of diaphragms employed, so that when the exposure for oue given stop in a certain light is found, the relative exposure for any stop is known.

2. Then for each individual lens should be tabulated:—(1) The size of the plate the lens is constructed to cover; (2) the focus for parallel rays—in the case of portrait lenses, I still am of opinion that a column devoted to back-focus is a useful addition, as it gives a photographer some definite idea of the shortest length necessary for a camera when a portion is built of a solid form; (3) the full available aperture that determines the intensity of the lens, and also the diameters of the lenses employed; (4) the diagonal of the full circle of illumination of the lens, or the guide to the largest plate the lens can cover; (5) the dimensions of the flange that must be employed, in order that the photographer may know, in selectiug it, whether it can be employed on the present front of his camera.—*The Optician.*

---

THE last new variation on the common "Please-look-pleasant" formula, seems to be the following, which we clip from *Answers*: "Photographer: 'Now, sir, if you'll look a little less as though you had a bill to meet, and a little more as though you'd been left a legacy, you'll make a beautiful picture.'"

## Patent Intelligence.

### Applications for Letters Patent.

6,261. Jebus Bickle, jun., Thomas Edwin Bickle, and John Baragwanath King, Great Western Docks, Plymouth, "Improvements in Photographic Prints."—April 13th.

6,340. George Teasdale Teasdale-Buckell, 55, Chancery Lane, London, "Improvements iu the Production by the Aid of Photography of Surfaces for Use in Printing iu Colours, and in Means or Apparatus employed therein." —April 14th.

6,341. George Teasdale Teasdale-Buckell, 55, Chancery Lane, Loudon, "Improvements in the Production by the Aid of Photography of Surfaces for Use in Printing in Colours, and in Means or Apparatus employed therein." —April 14th.

6,364. William Bevois Parker, Duncan Frederic Christy, and Robert Overton, 19, Southampton Buildings, London, "Improvements in or relating to Hand or Detective Photographic Cameras."—April 14th.

6,514. John Draper, 154, St. Vincent Street, Glasgow, "A New or Improved Means of Making Direct Vignettes."—April 16th.

6,533. Richard Whitehorne Savage and the Sun Camera Company, Ld., 186, Fleet Street, London, "Improvemeuts in or Pertaining to Photographic Cameras."—April 16th.

6,534. Richard Whitehorne Savage and the Sun Camera Company, Ld., 186, Fleet Street, London, "An Improved Photographic Shutter."—April 16th.

6,571. Eugen Albert, Temple Chambers, Londou, "Improvements in Letter-press and Lithographic Processes Based upon Photography."—April 16th.

6,572. James Yate Johnson, 47, Lincolu's Inu Fields, Loudon, "Improvements in Dark Slides for Photographic Purposes." (Paul Tournachon, France.)—April 16th.

6,594. Frederic Louis Perken, Edgar Theodore Perken, and Arthur Rayment, 34, Southampton Buildings, London, "Improvements in or in Connection with Photographic Cameras."—April 16th.

6,618. Sir Charles Stewart Forbes, 21, Finsbury Pavement, London, "An Improved Device for Washing Photographic Negatives."—April 17th.

6,672. James Ford, 1, Bedford Terrace, Plymouth, "Combined Outdoor Developing Tray and Dark Slide."—April 18th.

6,715. Henry Baker Norton, 77, Chancery Lane, London, "Improvements in and Relating to Shutters for Photographic Cameras." (Date applied for under Patents Act, 1883, Sec. 103. September 18th, 1890, being date of application in United States.)—April 18th.

Hawk-eye Camera.—A detective camera beariug this name has been recently issued by the Blair Camera Company, and the agents for it in this country are Messrs. Taylor, Taylor, and Hobsou, of Leicester and London. It possesses several features which make it valuable not only for hand use, but for occasional employmeut on a stand when long exposures are necessary. For this latter purpose it is furnished with an interior focussing screen, which is accessible only wheu a shutter at the back of the iustrument is removed, the said shutter, by the way, fastening into its place by a unique spring movement. The camera can be fitted to work with plates, with separate films, or with an Eastmau roller which provides for forty-eight exposures. The focussing is brought about by a screw at the back, in coujunction with a sunk dial, which is marked for various distances under 100 feet. The camera is designed for 5 by 4 plates, so as to allow some margin for faulty direction, a fault which is, however, guarded agaiust by the presence of a finder. The lens is a T. T. and H. 6-inch (detective) working at *f*/8 ; but it is provided with a sliding diaphragm plate with three openings of varying diameter. The shutter is set by a simple winding operation without uncoveriug the lens, so that no extra cap or flap is wauted, and its speed can be regulated to a nicety. The eamera is uuobtrusive in appearance, well-made, and has no projecting knobs or studs.

## Correspondence.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION.)

Sir,—I regret to find a slight error has occurred in the stylograph copy of my notes supplied to the press of the proceedings of the above Club in your last week's issue.

By the omission of a single letter what should have read "a misleading and *almost* incorrect statement," appeared as "a misleading and *a most* incorrect statement." As I should be sorry to be guilty of any discourtesy of speech to your contemporary to whom the expression refers, I will be glad if you will publish this explanation. Harry D. Gower.

*April 18th.*

## Proceedings of Societies.

Camera Club.

On Thursday, April 16th, Dr. C. S. Patterson in the chair, Mr. J. Howson read a paper entitled "Conventionalism in Colour."

Previous to the lecture, the Hon. Secretary handed round some early prints sent by Messrs. Marion & Co. from the flashlight negatives taken the previous week ; also one of Manson's focussing cloths, which are made in convenient form for covering the whole of the camera. Dr. Patterson showed a Bain's mask-cutter.

Mr. Howson, in his paper, dwelt on the possibility and desirability of suiting the monochrome colour of photographic prints to the special subject in each case represented, and he illustrated his points by handing round several prints on alpha paper.

Criticism and discussion followed from Messrs. Horsley-Hiuton, Davison, Gale, Stephens, Bright, and the chairman.

On Mouday, April 13th, there was a special lantern evening at the Club, and oue of the largest and most interesting collection of slides ever shown at the Club was brought together by members and frieuds.

The extra meeting was appointed for the purpose of working off the arrears into which the lautern exhibition had fallen, owing to the period of removal into the new premises. Over 400 slides were showu—almost all new at the Club—the work of Messrs. Gibbons, Jones, Elder, d'Arcis, Noel-Cox, Carpenter, Bennet, Lawford, Laurie, Maskell, Matthews, Bright, Hughes, H. M. Hastings, Andreae, Huskisson, Burton, Cembrano, Seyd, Chang, and Fitz-Payne.

On Thursday, April 30th, Mr. J. Traill Taylor will read a paper on "Lantern Optics."

London and Provincial Photographic Association.

*April 16th.*—Mr. G. W. Atkins in the chair. A demoustration of polarised light by Mr. J. J. Briginshaw, announced for this date, was postponed to the 30th inst., in consequence of the non-delivery of the oxygeu gas.

Mr. C. H. Cooke made a contribution of several platiuotype prints to the album of the Association. He also exhibited some sepia platiuotype prints that had been developed with a hot bath for black tones ; he was unable to detect any difference from those developed according to the sepia formula.

Mr. P. Everitt drew attention to an advertisement in the journals referring to the use of ammonia with erythrosine. He questioned whether the patent referred to in the advertisement covered the dipping process, and, further, whether the addition of ammonia was absolutely necessary.

To the latter query Mr. C. H. Cooke replied, decidedly not.

Mr. W. E. Debenham said he doubted whether erythrosine of the particular variety now used was suggested by the patent mentioned, as, in all probability, it was not brought out until afterwards ; and he was of opinion that the patent was not valid, from the directions giveu with it not being sufficient to enable it to be a workiug process.

Mr. C. H. Cooke stated that the use of a screeu was not necessary ; equally good results could be obtained without it.

Mr. Weir Brown exhibited some sepia-toned bromide prints; the toning bath used was—

| | |
|---|---|
| Nitrate uranium ... ... ... | 100 grains |
| Ferridcyanide pot. ... ... | 100 grains |
| Water ... ... ... ... | 24 ounces |

The remainder of the evening was occupied with discussing the rules of the forthcoming lantern-slide competition, which was fixed for the second Thursday in October.

### Holborn Camera Club.

At the usual weekly meeting of this Club on Friday last, Mr. Fred. Brocas gave an instructive lecture on "General Hints to Beginners," dealing with the uumerous stumbling-blocks which seem to enter into a compact to frighten a beginner. He specially mentioned the matter of foreground; under-exposure was also dealt with at great length. Most beginuers, he said, always under-expose. It was much better to over-expose, because, by judicious developmeut, a fair negative may be obtained from au over-exposed plate, but an under-exposed one would never give a good negative.

In the discussion which followed, halation formed the chief topic, it being the general opinion of the members that, although troublesome, backing the plate was certainly advantageous.

A vote of thanks was passed to the lecturer, aud the meeting separated.

### Croydon Microscopical and Natural History Club (Photographic Section).

A meeting took place on April 17th, with Mr. Edward Lovett in the chair, when an exhibition of hand-cameras took place.

The next ordinary meeting will be on May 1st, when Mr. D. E. Goddard will read a paper eutitled "Elementary Silver Printing."

On Saturday, April 25th, a half-day excursion to Oxted for Godstone will take place.

### Richmond Amateur Photographic Society.

On the 17th inst., Mr. Jeffrey in the chair, the subject for discussion was "Iuteusifying, Reducing, and Retouching."

Two pieces of home-made apparatus were shown—a frame or box for contact printing, either of paper or transparencies, by Mr. Faulkner, and a shutter by Mr. Richardson, both being of iugenious design and excellent workmanship.

The discussion which followed was productive of many practical hints.

### Leeds Photographic Society.

On the 20th inst. a paper ou "Bromide Printiug and Enlarging" was read by the hon secretary, Mr. S. A. Warburtou, the chair beiug occupied by Mr. J. W. Reffitt.

Mr. Warburton pointed out that the chief advantages of the bromide process were that it can be worked iudepeudent of daylight, the rapidity with which priuts can be produced, and the close resemblance that a good bromide print has to a platinotype picture. In describing the manipulation of the process, the various classes of paper in the market were referred to, the "slow, rough surface" being the one which seemed to yield the best results. The great secret of obtaining pure whites in the prints was a liberal use of the acid solution after fixing, and for this a one per cent. solution of sulphuric acid was the best. In dealing with the subject of enlarging, the kind of apparatus for use, both with daylight aud artificial light, was described, the former as giving the best results, and being less expensive to construct.

Photographing Fishes.—M. Marey has succeeded iu photographing the movements of an auimal under water, taking proofs at the rate of fifty in a secoud, with exposures from 1-2000 to 1-3000 of a second. A set of twelve photographs gives all the phases of the undulatious which the medusa impresses upon its umbrella of a locomotor apparatus. A ray has been taken in profile while waving the edges of its flat body, and the curious mode of progressiou of a comatula has been taken.—*Detroit Free Press.*

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

Mercurius.—*Formula for Sensitising Paper.* Unless very heavily salted, a plain sixty-graiu solution of silver nitrate is generally employed for sensitising paper, which is left on the bath until it lies flat; drained well by passing over horizontal glass rod, and dried vertically whilst suspended from wooden clips. It may then be advantageously fumed with ·880 ammonia in a close chamber. The practice of usiug stale albumen is sometimes resorted to, uuder the impression that it is easier to get with it a uniform coating.

L. E. T. (Jersey).—*Aluminium Mounts and Fittings.* One optician at least now supplies all his lenses in aluminium mounts, and several camera makers employ the metal largely to diminish the weight of tourists' outfits. We are not sure that alumiuium is proof against the attack of sea air, but in inland towns this metal remains untarnished for a considerable time.

W. J. S.—*The Watch Camera.* Messrs. J. Lancaster and Son make two sizes, the smaller taking pictures 1 by $1\frac{1}{2}$ inches, but, from the description, it does not appear that there is any simple contrivance for changing the plates.

Zero.—*Ferrous Oxalate Deposit.* The white veil that you sometimes notice in your negatives may arise from the precipitation of oxalate of lime. If so, it should disappear in the citric clearing solution, or in very dilute hydrochloric acid. Be careful about the use of the latter, for fear of stripping the film.

J. P. Jones.—*French Weights and Measures.* See last page of the Year-Book. A gramme is equal to 15,434 English grains, and a litre is the measure of 1,000 grammes of water at its maximum density, 4° C., or 39° Fahr. For a one-per-cent. solution dissolve, therefore, one gramme in a decilitre, or teu grammes in a litre of water.

Tyro.—*Recovery of Platinum from Waste Solutions.* Mr. Willis stated last week that he acidified strougly with hydrochloric acid, and boiled with some scraps of zinc, when all the precious metal is thrown dowu in the form of platinum black.

A. L. S.—*A River Scene.* The cattle are satisfactory enough, but the horse in the nearer foreground appears too dark. Could you not screen it off a little during the printing, and so get a better effect?

W. B. (Exeter).—*Faded Daguerreotype.* Unless you have had some preliminary experience, or if valuable, it might be well to entrust it for restoration to Mr J. Werge, 11a, Berners Street, W., who will probably clean it with cyanide and re-tone it with sel d'or. You may then copy it with the camera, screening off side lights, as Mr. England suggested some years ago, by sinking it in a square shelving frame for that purpose.

Middlesex.—*The Affiliation Scheme* is not dead, as you suppose, but still under the consideration of the council. The details are not yet quite settled, but there is ample authority for your addressing au application to the secretary of the parent society, or passing a letter to Mr. Biden, at 50, Great Russell Street, W.C.

R. M.—*Brussels Photographic Exhibition.* By notice paper, just received, intendiug exhibitors are requested to communicate, before the first of May, with the Organising Secretary, M. Ch. Puttemans, Ecole Industrielle, Boulevard Du Hainaut, Brussels. The Interuational Congress meeting in that city in August may be expected to bring together a fair assembly of appreciative visitors, and generally to lend interest to the undertaking.

Received.—A. M. M. and other correspondents; also, a copy of "Electricity in Transitu—from Plenum to Vacuum," by Prof. W. Crookes, F.R.S.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1704.—*May* 1, 1891.


CONTENTS.



## SPAIN AS A RECREATION GROUND.

BY ANDREW PRINGLE.

Many amateur photographers are now-a-days sighing for fresh lands to conquer, and a few words about Spain from one who has very lately left that country may be productive of encouragement or act as a warning, according to how the words are taken, and to how the prospect pleases or appals the reader. For there is much to be said on both sides of the question: on the one hand, Spain is certainly much less photographically hackneyed than Italy, France, Germany, &c.; on the other, there are difficulties to be encountered in some parts of Spain which may not be met, or may be met in a less degree, in other better known and more travelled countries.

As to wealth of subjects in Spain, there can be no question, particularly if we have a *penchant* for architecture, external or internal. I know of no country where the architecture is so varied, so striking, and, on the whole, so pure as in Spain. Moorish architecture of a certain period is found in perfection in Southern Spain, while, so far as I know anything of architectural science—which is not far—I doubt whether the Gothic style is to be found in such purity and beauty anywhere as in Northern Spain. Some of the architecture in Spain is of the easiest kind to photograph, exteriors such as those of cathedrals, churches, &c., in the north. Much more difficult, but, perhaps, even finer subjects, will be found in interiors such as those of Moorish origin at Seville and Granada, and those of Christian, or Moorish and Christian, origin at such places as Toledo, Avila, and other towns chiefly in the northern districts.

Taken as a whole, the country cannot lay a general claim to beauty of landscape, yet there are districts exceedingly grand in mountain scenery, notably districts near Malaga, and in the very north, around San Sebastian, for example. I believe that on the east coast there are some very fine landscape districts—Murcia, the neighbourhood of Almeria, Cartagena, and so on—but of these I cannot speak from personal knowledge. One other point is worthy of the photographer's notice. In many districts, characteristic, quaint, and artistic costumes have by no means yet gone out of date. The mantilla certainly seems dying out, but in Avila, Salamanca, Jaen, Valladolid, Burgos, typical costumes and trappings may yet be seen in full force, while in other districts, not visited by me, there are to be found in common use costumes even more quaint than those that came under my notice. Lastly, whatever we may say as to the national *corrida de Toros*, or bull-fight, as a sport or as a crime, there is no denying the fact that it is a grand opportunity for a hand-camera. It is no small matter to see, as we saw in Madrid, about 18,000 people *en fête* watching a party of very richly-dressed men doing their best to tease a bull into activity, causing it to impale horses on its horns, and finally, with every circumstance of ceremony and pomp, killing it according to a code of rules and *secundum artem*. I say that, sport or no sport, harmless or criminal, a bull-fight is good to photograph, and, so far as I know, a bull-fight has never yet been really well photographed. I have only developed a few of my negatives, and, so far as I have gone, all my negatives are useless, thanks to a new and untried, but all the more expensive, hand-camera being hopelessly out of "register," so that I may safely say that as yet I have seen no good bull-fight photographs. Photographs of a bull-fight are sold in Madrid, but they are only poor enlargements from what have evidently been very middling negatives.

I venture, then, to say to my reader that Spain is a first-rate field for photography. Subjects are good, varied, and plentiful, and the camera is just sufficiently known to cause the people to assist rather than impede the worker. True that sometimes I met with *trop de zèle* by people wishing to adorn my views with their persons, but they were always amenable to reason, and, when young, were always quite satisfied with a position well beyond the field of my lens.

Now for the disagreeables of such a tour. I am a pretty well hardened traveller, and quite used to "roughing it," but I should not care to face Spanish travel without a courier or someone to do the unpleasant work at railway stations, diligence offices, and the like. Time is no object to a Spaniard, nor, apparently, is breath, for not only is the waste of time exasperating, but the fluency of language, chiefly strong, is simply appalling. The scene on the arrival of a train at some stations was pandemonium, for it seems that all the "loafers" of a town congregate at the station and distract the alighting passenger with offers of help. Then the formalities of booking and obtaining possession of baggage are maddening, false coins are rife, and beggars everywhere as thick as stones in the street. Even Naples is not "in it" with Spain in the matter of mendicancy. The abominable and, under certain conditions, dangerous custom of deformed and maimed paupers exhibiting their horrors in public is common throughout the country; a serious malformation is a valuable source of income in Spain.

Then, again, the sanitary arrangements, even of many of the best hotels, are anything but good; except in the very best hotels in the south they are horrible. It is pretty well known that a community living habitually in unsanitary conditions often "acquires immunity" from septic diseases, but the chance visitor may fare badly.

No doubt travelling may be cheaply done in Spain, but attempts at economy would greatly lessen the pleasure and increase the difficulty. I do not think that a tour in Spain can be done so cheaply as a tour in Italy or in France; certainly not if the larger cities are visited during holiday times, such as Holy Week. On my late visit I had the same courier as I employed on a previous occasion, and I would not willingly face Spain without him.

On the whole, while I have candidly stated the disadvantages of Spanish travel, I can safely say that I know of no country which will better repay the student or photographer of architecture than Spain. The over-particular or impecunious had better seek other fields, but anyone who wishes something quite out of the beaten track, and something not only unique but good, will do well to spend a month in Spain.

## DR. J. M. EDER'S CRITICAL EXAMINATION OF SCHIENDL'S "HISTORY OF PHOTOGRAPHY."

BY C. SCHIENDL.

Since the critique which appeared in the Photographic News about the above-mentioned book contains perversions and false interpretations of some passages which may deter the success of a work which cost me a great deal of trouble, I trust that you will permit me to make a reply in your columns.

I must first decidedly deny Dr. Eder's statement, published in his *Photographische Correspondenz*, that my first three chapters are simply extracts from his "History of Photo-Chemistry." I have expressly pointed out in my work that I do not aim at introducing any photo-chemical history, and will refer to it only in so far as it forms the precursor of photography, and stands in direct connection with it. Besides, there is a total diversity in the contents of our two works, owing to the different purposes which we pursue. Dr. Eder seeks to prove, in his "History of Photo-Chemistry," that certain facts were known in the earliest ages; for instance, the brighter colouring on those sides of fruits exposed to the sun, and that many colours and materials bleach in sunlight, that the ancients possessed a knowledge of the effects of light; whilst I, in a very short paragraph, attempted to give a mere sketch—in order not to spend unnecessary time—to the effect that the ancients, and even a large part of the people during the middle ages, possessed no knowledge of the effects of light and of optics. My first three chapters contain matter so totally different from Eder's "History of Photo-Chemistry," introduce so many dates, and open out so many different historical points, to those contained in Eder's "Fragments," that one can only describe the attempt to run down my book on the part of this critic—who, at the same time, describes himself as a competitor—as a delusion which has its source in a supposed monopoly of every kind of photographic literature.

I have used many works in writing my book, among others Bischoff, Scheele, Hugh Murray, P. Moyriac de Mailla, Senebier, Herschel, Hunt, Gilbert's "Annalen," Harrison, Fabre, and many articles in journals where the information is authentic. I have sought from Eder's "Fragments" the sources mentioned by him, and, when they were serviceable to me, I used them. On the very few (and most unwilling) occasions on which I have applied his own information, I have quoted him, and called attention to the fact that he was the first, &c., &c. The great historical works of Schlosser, Becker, &c., contain hardly any quotations: but it would not occur to anybody to accuse them, on that account, of being published without sources of information, except "drawn from the works of others." The worth of a history is established, not by mere statements of facts, such as are to be found in Eder's "History," but by the spirit which is to be seen in the setting forth of these facts, and by the just exposition of deserving merit and mistakes which have been committed, and in the assertion of such facts as stand in connection with the subject.

I am fully convinced that an impartial comparison of our two works would prove the evidence of the injustice of Eder's assertion. Respecting his broad statement that I pervert and distort Mungo Ponton's and Vauquelin's claim to precedence (*Phot. Corres.*, p. 149), I affirm that the worth of this statement may be judged by bearing in mind not only the letter, but the spirit of my text. I write (page 16): "The discovery that chromium is an element, and the discovery of chromates, were made by the French chemist, Vauquelin, in the year 1797, and also the discoveries appertaining thereto, viz., that a silver salt, when combined with chromic acid, gives a carmine red precipitate; and these observations he pursued to the discovery that the combination is sensitive to light, for he observed the colour change to purple-red when exposed to sunlight. This discovery of Vauquelin's appears to be the foundation of all later publications (for instance, Ponton's) on the sensitiveness to light of chromates." That chromates change under the influence of sunlight is a fact now well known. Vauquelin discovered it apparently in an accidental manner, and his discovery was used by others (for instance, Ponton) for independent study of this property in conjunction with organic substances, and was used for photographic purposes, which Vauquelin himself did not attempt, and which only Ponton, first, and quite independently, has succeeded in doing. My statement that Vauquelin's discovery appears the foundation of the later discovery which led to chromates being applied to photography might, therefore, be considered completely justified. But Ponton's works may also be pointed to as independent discoveries. Eder's assertion, which closes with these words, "Therefore it appears unjust to ascribe to Ponton only the lot of having discovered photography with chromic compounds," proves itself false, for Vauquelin has not made the smallest contribution to the discovery of photography with chromium salts. My assertion (which Eder endeavours to circumscribe) to the effect that the exclusive merit of having applied this property to photographic purposes is Ponton's, does not appear in the least like a *displacement or a perversion*. These expressions might be more fitly adopted in describing his criticism of my work.

My competitor argues further: "Still more reprehensible is the manner in which Herr Schiendl treats of the further development of photographic methods by means of bichromate of potash, for this part of his "History" rests on a remarkable error on his part, which is seldom committed by the writer of a history. I shall prove conclusively that the author sets forth Ponton's work on chromates quite falsely, and draws quite wrong conclusions therefrom. Herr Schiendl writes on page 89 of his 'History': 'Mungo Ponton studied these salts (chromates) more accurately, and discovered that they, specially the bichromates, when exposed to the light with organic substances, so change as to lose their solubility and their stickiness, and wholly, or in part, according to the effects of light to which they are exposed, their power to absorb or give out water.'

"On this statement, which I have quoted in order that it may be well considered, the author establishes the foundation of his 'History of Photography with Chromium Salts,' and erects a structure of historical description which proves itself a castle in the air, because, in Ponton's report to the Royal Society of Scottish Artists, nothing of the kind occurs. Quite as untenable is the phrase on page 277 of Schiendl's 'History': 'From Ponton we learn the sensitiveness to light of chromated gelatine,' for Ponton does not say a single word, in his above-mentioned report to the Royal Society of Arts, about the sensitiveness of chromated gelatine. Therefore, the historical views propounded by Schiendl are false, and this consideration shakes one's belief in the trustworthiness of other descriptions."

I consider it right to make this announcement. Mungo Ponton, in his first report to the above-mentioned society, has spoken only of chromium salts, which, when charged on to paper, give a picture; but in the space of time which elapsed between 1839 and 1853, when Talbot applied the chromated gelatine to steel (which, apparently, is the foundation of Ponton's statement, for he mentions nothing in his first report, which the reader will find given word for word on page 98 of my "History," of having discovered this property of chromated gelatine, and uses other means; for instance, platinum-chloride), Ponton has made mention of this process in the *Edinburgh New Philosophical Magazine*, and also in many other technical journals which I do not happen to have by me, and specially emphasised the fact that better results are to be obtained with gelatine. I have found this passage frequently repeated in English magazines by reliable authors, although the assertions are so very scattered that a quotation does not appear feasible.

(*To be continued.*)

---

*The Optician*, the new organ of the optical, mathematical, philosophical, electrical, and photographic industries, enters on its fifth issue this week. It promises well, and, although intended as a trade organ, has many features which make it interesting to outsiders. We wish it success.

MESSRS. NEWTON AND CO.'s recently published catalogue is quite a storehouse of good things in the way of lanterns and optical projection apparatus. The section devoted to the scientific application of the instrument is especially interesting, for it contains descriptions and illustrations of the newest devices, including the electric lantern fitted with spectroscopic and microscopic nozzles, and utilising the Brockie-Pell form of lamp; the microscopist's bi-unial lantern, the micro-polariscope, and other well designed appliances for projection purposes.

## THE SECOND TRIENNIAL EXHIBITION AT GLOUCESTER.

### SECOND NOTICE.

"THE Cockle Gatherers" is just one of those subjects that Mr. J. E. Austin and Mr. Frank Sutcliffe know so well how to treat. Wave-ribbed sand and mackerel-ribbed sky furnish the materials for Mr. Glazebrook's *mise-en-scène*, and the busy toilers in their grotesquely assorted costumes furnish strongly the picturesque element. Most of them are busy with their sordid occupation, and are, apparently, quite unconscious of the presence of the now almost ubiquitous camera. Their costume is so nearly masculine that it is only after some considerable inspection of the figures that it dawns upon the beholder that they are women. With such admirable materials Mr. Glazebrook, by two errors, has just missed making an admirable picture. The figures are too large; but the next fault is a much more serious one. Most painters are content to keep the horizon line, when it forms the boundary between sea and sky, exactly parallel with the principal line of the frame or mount. The author of this picture evidently thinks otherwise, and has made the sea to travel up hill at a very considerable angle. One might have charitably thought that the picture had slipped from the mount; but, unfortunately for this argument, there is another photograph by this gentleman with the same fault.

Mr. Bhedwar has sent the "Feast of Roses," and the series shows unusually well in this well-lit gallery, but there is besides a fresh picture that calls for more than a passing notice; it is called "Two's Company," and shows a lady, clad in the diaphanous costume of the East, half sitting, half reclining, with quite Eastern languor. She is daintily toying with a parrot. A short distance away a white bird of the same species is gloomily eyeing the favourite of an idle moment, and is evidently indulging in a fit of sulks. There are some faults in the composition of the picture, but it is so delicate in treatment, and the Eastern feeling of the whole picture is so well conveyed, that it is sure to become a favourite.

Mr. Charles Reid has quite distinguished himself in his instantaneous pictures of animals. Mere rapidity does not count for much in these days, but these have something else besides. Forcible and yet delicate, in spite of the very short exposure, they are all pictures, and not mere examples of difficulties overcome. In one picture, a broken cask helps to furnish an effective background to an interesting group of puppies. One has a bone in its mouth, and is snarling at a white cat who looks with envy at the coveted treasure. The expression is half human, and at once recalls Landseer's "Jack in Office." There are, besides, a number of pictures all equally good—a group of goats, flocks of sheep, herds of horned cattle, ducks, swans, a mare and foal, and others, all of them showing the same technical and artistic skill.

Mr. Lyd. Sawyer is well represented by a large number of his well-known *genre* pictures, but there are, besides, some river scenes, several of which are new to us. The chiaroscuro of one, evidently a Tyne bit, is very fine. Murky smoke in striking contrast to sparkling water plays its part with due effect, and helps to make a striking picture out of very slender materials. Another similar in subject is striking from the peculiar mellowness and harmony of its atmospheric effect.

Mr. Court Cole is quite a coming man. His architectural subjects are always effective and well chosen, and he has sent besides some landscapes that show distinct artistic feeling, and of these, "Evening on the River" deserves special notice. A tree-covered bank of a stream runs away into perspective, and long streaks of evening clouds back the scene. A lazy ripple on the water breaks up the lights and shadows, and carries them on to the extreme foreground—or, in this case, fore-water, for the want of a better expression. The white sails of a yacht are most useful in carrying on light through the picture. There are some lovely cats sent by Mr. Lord, but surely it was not necessary to touch them up. They are much too good to need the brush work.

An extremely effective landscape is completely spoiled by the awkward introduction of a figure. The photograph is of large proportions, and shows a tempest-worn water course. It is winter-time, for the trees are bare, and there is an expression of desolation over all. Unfortunately, exactly in the middle of the picture, a figure with his back to the beholder is busily occupied in doing nothing in particular, and completely destroys an otherwise good picture.

Mr. C. W. Huson's "Early Morning" is a street scene of large dimensions, and the picturesque element is furnished by a quaint, octagon-roofed market house on the right. The whole picture is low in tone, but artistic in treatment, the time of day being well chosen for the subject.

Mr. J. M. Nicholson has sent a frame of six small marine studies taken with hand-camera, that are so well selected and admirably carried out that one could well imagine that the camera-stand had been used, and the most deliberate preparation adopted before the exposure of the plate had been attempted. They are all distinguished by great breadth—a quality often absent when very quick exposures are made—and perfect keeping. Indeed, they are as true to nature as monochromes can ever be. Sky and sea are in harmony, and the chiaroscuro would satisfy even a fastidious marine painter.

Perhaps the importance of the sky in landscape has never been better shown than in one of Mr. H. P. Robinson's pictures hung on the lecturer's rostrum. It is called "What Sport?" A mass of willow pollards form an important feature on the right of the picture, and furnish a strongly marked diagonal, running from right to left, where dark trees and dark shadows on the water support and give solidity to the composition. Figures are introduced with Mr. Robinson's usual skill, and the light dress of the woman tells with great effect against the dark masses of the trees. The whole is put into perfect harmony by the grand masses of clouds, which are exactly in the right place to complete the composition. The whole picture is characterised by great breadth, and we cannot help regarding it as one of the most perfect landscapes ever produced by photography.

Mr. W. H. Kitchen's "On the Lynn, Clovelly," is an enlargement of one of the most photographed spots in England, and this is not to be wondered at by those who know all the possibilities of the subject; but, notwithstanding the extreme beauty of the surroundings, there are more bad than good photographs of this lovely spot. This picture is fortunate in being one of the good ones. The foreground of brambles helps immensely in giving point to the whole scene.

Mr. Martin J. Harding has produced some extremely good small landscapes; but one of them is very striking —a pebbly watercourse, on the banks of which are stunted trees torn by angry winds. Distant mountains bound the distance, and force is given to the foreground by the dark shadows from the trees on the left. There is no black-and-white anywhere, and yet it is a very harmonious photograph.

Mr. Ernest Beck has several artistic pictures. "At Eventide" may be mentioned as one of them, for the mystery of twilight is well expressed. Praise must also be given for "Turning the Corner," a good picture composed of slender materials, for it is simply a ploughing scene; but the light and shade is well distributed, and clearly shows artistic feeling.

Mr. Carl Greger's little views are of unusual excellence. They are, unfortunately, hung very high, and, at a distance, the almost Bartolozzi red colour is not quite agreeable, but on a closer inspection their beauties become manifest, and they must be put in the very front rank among the many very artistic pictures sent to this Exhibition. "The Mountain Solitudes of the Tyrol" resemble the monochrome work of Turner, and it is difficult to give higher praise than this. Among the others sent by this gentleman, a delightful little picture of boys bathing in a stream is most attractive, but it is feared that its exalted position will cause it to be overlooked.

Mr. J. E. Austin is rapidly taking the very first rank as an artist, and many of his pictures seen at Gloucester would, by their extreme excellence, furnish a fitting answer to the unworthy carping of Mr. J. Pennell in his paper recently read at the Conference. They all have extreme individuality, and show, especially in the posing and grouping of his figures, that the artist, even when he has the misfortune to use the camera to express his art, still has command over his materials. "The Road by the Sea" is a complete illustration of this, and so is "The Last of the Ebb." The first is a little fishing hamlet, and the cottages are built above the wash of the waves on the *debris* formed by the crumbling away of the storm-worn cliff above. A fisherman with basket on shoulder pauses to gossip with two women who are resting half way up the steep path that leads from the shore. Magnify this little picture and supply the colour, and then there would be a picture worthy a place on the line at any picture exhibition. The second is simply a boat securely fastened to piles that throw strong shadows to the edge of the picture. The scum on the oily water indicates the turn of the tide. The distance is soft and indistinct, and the attention is arrested by the forcible light and shadow from the boat and its surroundings. Surely these are simple materials, but they were selected by an artist.

Enough has been said to show that the workers in the Gloucestershire Society have reason to congratulate themselves on the striking character of many of the pictures which have been brought together through their energy, and it is to be hoped that the Exhibition has been a financial success. It only remained open ten days in all, and lantern exhibitions were held every evening until the close, which took place on April 20th.

---

Photographers' Benevolent Association.—At a meeting on April 24th, Mr. A. Mackie chairman, two applications for grants were considered and assisted; and Messrs. F. Cherry and Ed. Hobbs were elected subscribers.

Croydon Camera Club.—At the meeting on the 27th April a demonstration of carbon printing was given by representatives of the Autotype Company. Excursions are now arranged to be held every Saturday, and instruction classes on Thursdays.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Colouring Aristo Prints—A Grainless Gelatino-Bromide Emulsion—Transferring Albumen Prints to Glass without the Use of Gelatine Solution.

*Colouring Aristo Prints.*—Liesegang's aristo paper has found so many friends and adherents everywhere, on account of its really excellent properties, that it will be of interest, no doubt, also to the readers of this journal to learn a method of colouring prints on aristo paper, which has been adopted for some time with much success by many of our leading amateur photographers. It will be easily understood that it would be detrimental to the gelatine surface of the aristo print if it were treated without preliminary preparation with water-colours, the gelatine sucking up the water together with the colour, and becoming soft. The picture must therefore be previously prepared as follows. A mounted print may be used, but it should be one which has been printed not quite so deeply as usual, and one which has not been squeezed on to a smooth surface. It is at first touched up in the usual manner, a small quantity of gelatine solution to which some alum has been added serving as a medium. After touching, the print is slightly smoothened, and then coated with prepared albumen, which latter may be repeated if the first layer proves to be too thin. The print is then laid flat, and allowed to dry spontaneously. If dry, the water-colours may be applied to the albumen layer, care being, however, taken that as little water as possible is used, in order to prevent its penetration into the gelatine film. The colours should not be laid on as thickly as oil-colours, and for the larger portions of the picture—as, for instance, for the backgrounds, dresses, &c.—aniline colours are to be preferred. The shadows of the folds in the drapery, &c., are worked over with transparent colours, in order to preserve clearness. For the face, the hands, and the arms, very little red should be used. To obtain a fine and natural rosy tint, a trace of light red should be taken on the almost dry brush, beginning always in the centre of the cheek, and being careful not to touch twice on the same spot while wet. Let the touches be separated, as in the case of retouching, and when finished rub over the tinted portion very gently with a slightly moistened brush. In the case of light brown hair and beard, commence with a light brown, and finish with sepia. In order to obtain a more harmonious result, the picture may be coated, after colouring, with enamel-collodion.

*A Grainless Gelatino-Bromide Emulsion.*—Mr. F. Gaedicke, of Berlin, has succeeded in producing a gelatino-bromide emulsion in a totally unripe condition without the well-known "grain," the size of which, in the ordinary emulsion, grows, as is generally admitted, with the sensitiveness of the preparation. Only when enlarged five hundred times by a microscope does the new Gaedicke emulsion show what may be called a grain, but still embedded in an apparently structureless mass. For some purposes—for instance, for astronomical and micro-photographs, for transparencies destined for enlargements, for duplicate negatives, stereograms on glass, and for lantern slides—an emulsion without grain would undoubtedly be an advantage; but it is to be regretted that the plates coated with it are very much less sensitive than those commonly in use, an exposure forty times as long as one required by a highly sensitive dry plate giving a strong picture, and but a six hundred times exposure leading to the best result with short development. In comparison with the exceedingly short exposure which is sufficient in the case of the modern dry plates, the insensitiveness of the new emulsion is not so extraordinary as it may seem, and for certain purposes—for instance, for the production of diapositives, &c., in the printing frame—the short additional time of exposure required with it will certainly be of little consequence in comparison with the advantages which it offers. For other purposes, however—above all, for astronomical photography and for portraiture — the Gaedicke emulsion will be practically useless on account of its low sensitiveness. For the development of plates coated with grainless emulsions Mr. Gaedicke recommends, as the only suitable one, the hydroquinone-potash developer diluted with water. With it the plates may be developed in different tones, according to certain additions made to the developer. So they can be developed in greenish-black, Indian red, sepia-brown, in colder or warmer tones, and they may be transferred even in a sulphocyanide gold bath through warm brown into violet, even to blue, with undoubtedly valuable results for some practical purposes, more specially for the production of lantern slides and stereograms on glass.

*Transferring Albumen Prints to Glass without the Use of Gelatine Solution.*—According to Mr. Fr. Wilde, this may be done in the following manner. A small quantity of ox-gall is mixed with an equal quantity of alcohol, and the mixture is allowed to stand for several days with repeated shaking, when it is filtered, and poured evenly over a well-cleaned glass plate. A washed and well-drained albumen print is laid on the prepared plate, the superfluous water being removed by the aid of a squeegee, and the plate placed aside to dry. After about one hour, the print comes off with a highly-glazed surface. In order to preserve the gloss on the print also after mounting, the following may be used. As soon as the albumen print has been transferred to the glass plate, a piece of the finest parchment paper of somewhat larger dimensions, which has been previously coated with starch paste, is squeezed on it, and then coated on its back with a thick solution of gum, or of dextrine. After drying and trimming, the whole is placed on a piece of moistened cardboard, rubbed down with a folder, and pulled through the rolling machine (not burnished) before the picture is quite dry.

---

Claim by a Photographic Operator and Retoucher.—Charles H. Dance, photographic operator and retoucher, sued Thomas Winnett, photographer, Bolton and Blackburn, for £3 12s. 6d. Plaintiff stated that he was engaged by defendant as operator and retoucher at Bolton. He was in the employ of the defendant for about five weeks, when he was summarily dismissed without just cause, defendant refusing to pay his wages (30s.) for the current week. The rest of the claim was made up by 30s. for one week's wages in lieu of notice, and 12s. 6d. for the value of articles purchased by plaintiff in order to satisfactorily carry on his work. The defence was that plaintiff was an incompetent man, and that he was unable to execute work equal to the specimens supplied to the defendant, mainly on the strength of which he was engaged. Specimens of plaintiff's photography were submitted to his Honour for inspection, and he characterised them as, in his opinion, excellent productions. Defendant explained what he considered to be certain technical defects in the photographs, but his Honour, in entering a verdict for the plaintiff for the full amount claimed and costs, said he considered that plaintiff had done his work well.

## THE PROFESSIONAL SHOW-CASE FROM AN AMATEUR'S POINT OF VIEW.*

BY REV. F. C. LAMBERT.

I am quite prepared to be told that any suggestion I may herein make has either been made before, or is quite out of the range of practical application. Now I would respectfully submit that it is not so much with a view to offering ready-made ideas that I pen these jottings, as that I am in hopes that one or two of my suggestions may be just enough to start the thoughtful ones in working out ideas which shall apply to their own special and individual case. Each man who is in earnest will combine or select just those ideas that are likely to be applicable to his own case, and ignore the rest.

One reason which makes me think there is some need for the professional worker to give half an hour's thought to the subject of the show-case is the painful similarity between A's, B's, C's, and D's door-cases all in the same street. This is so much the case that it becomes rather difficult to remember any feature at all distinctive of any one of the four.

The usual thing is a dismal-looking wooden box (usually black) with a glass front. The "case" is lined with velvet (?) of a bilious green. To the back of the case are nailed or pinned the various specimens in a way which reminds one of a case of entomological specimens set out to dry.

Is there any reason why the case should always be attached to and *stick out* from the wall? Why not let it *stick in* for a change? Why not let it sink into a shallow recess in the wall? Even that would be a change. Again, why need it be always the same shape (about two feet by three feet)? Why not of two, three, four parts, and of varying proportions? Or, if it must be one case, then subdivide it by some simple internal division of unequal sizes, putting say, two or three children in one part, a group or two in another, and three or four large heads in another, and so on.

In towns it frequently happens that the photographer's studio is up "ever so many" flights of stairs, the ground floor often being occupied by some other business firm, so that the only way of letting the public know that there is a photographic studio in existence at that place is by displaying one or two show or wall-cases close to the door. However, even in cases of that kind, it often happens that there is a short passage, a porch, or entry, which often might be made more attractive and pleasing than is often the case. In such a case, several small shallow cases let into the wall would tempt the loiterer to glance round. However, where there is a little more room one's ideas expand at once. I should like to see a porch or entry fitted up with one side occupied with several small recessed cases of various designs; on the other, a structure which would call to mind something in the way of an over-mantel, of the simple panel and bracket form. I should make this as real as possible. A few choice specimens in simple frames or stands on the mantel, and perhaps a few more inserted behind a specially-designed panel-piece, so contrived that these could be easily changed. Among my specimens I should be tempted to place a few pieces of good and genuine old china, and perhaps a genuine bronze or two, or even a few pieces of terra cotta or small marbles. But whatever was there placed should be genuine; in fact, what was there should be just the sort of thing that I would have in my own favourite room at home. Real, good, and simple should be my watch-words.

Or perhaps the over-mantel idea would be found impracticable for some reason or other; but suppose I had the corner of a small window, then in that case it should be to me as a favourite corner of a favourite room. Perhaps an easel with an enlargement—one or two—not too many; then one or two small tables, or a corner table with one or two shelves; a bracket or two, perhaps, made of a bit of simple, genuine old oak, carved work if possible; I could then have a couple or more neat albums filled with selected specimens on the tables. In that way I could simply turn over a leaf or two of each every morning, and by the time one had got to the end of the book, it would be time to begin again, so that those who passed my window every morning would have half-a-dozen fresh faces to look at every day. Their curiosity would be stimulated, and set wondering as to who or what the next page would display. As to frames, after all the simplest is usually the best. If the frame is very splendid, then your work becomes obscured and overshadowed. Your object is not to make the spectator say, "What a splendid frame that photograph has round it!" but rather, "What a very nice photograph that frame contains, and how admirably the frame suits the subject!" It may be laid down that *white* or very light-coloured frames are generally to be avoided. A white frame, like a white mount, weakens the strongest light of your picture, and tends to make the shadows dead and dull.

For displaying silver prints, perhaps, after all, the simple, plain glass without frame is best; or if a frame is desired, then a very fine silk velvet of a pure, rich, dark olive green, tending to russet rather than blue, is, perhaps, the most favourable shade with the red purple-brown of the silver print. In platinotype and other black-and-white processes a frame and mount seem to lend an advantage. The mount, however, should not be white, or even near white, otherwise the large white space fills the eye, to the distraction of the small white parts of the picture. There is still an opening for a good tint for mounting black-and-white photographs. What is wanted is a mount with a slight grain, and of a tint something between pale straw and weak coffee—it is a tint one sometimes sees on opening a long-forgotten portfolio of engravings.

As to frames, there is again a difficulty. A black frame is apt to weaken the richness of shadow. Perhaps the best seems a dead black with dead gold, but sometimes a rich, deep brown—old oak or walnut—has a good effect.

Now as to flowers. As one who loves flowers, it is hard to say, do not have flowers in your show-case. Why need one banish our greatest help and treasure? Although it must certainly be remembered that their welcome presence means additional trouble. First of all, it is fatal to your reputation to have flowers and neglect to renew them at least once a day. Nothing can give a worse impression or general effect than neglect. In nothing can greater taste be shown than in the arrangement and disposal of a *few* flowers. Firstly, then, they must be renewed and receive daily attention. Secondly, as their presence entails water and moisture in the air, this calls for the precaution of either thoroughly protecting your specimens, or keeping your flowers in a separate partition, or making up your mind to cast aside any specimen immediately it shows the slightest deterioration; and perhaps, after all, this last plan has the advantage of keeping one's

* Continued from page 315.

stock of specimens constantly under notice and renewal. The cost of a few new specimens now and again is really nothing compared to the loss to one's reputation by never having anything different on view.

To sum up the whole matter into what I should like and not like. I don't want to see any more composite, cut-out mounts with openings of all sorts of shapes and at all sorts of angles; nor any of those very thick mounts which represent nothing in or out of nature or art; nor do I like to see curly mounts. I do not care to see the show-case used for general advertising purposes. It is also a mistake, I think, to have too many specimens, and also to mix prints made by various processes. What I would suggest is a *few* and *good* specimens. Have no two alike; let them differ in subject, size, style, lighting, and even in the frames a little variety is a relief. I venture to commend the suggestion of varying the shape and form of show-case, to line it with a material which is at once good, unobtrusive, and not likely to be affected by light; to have several small cases rather than one large case, to keep different process work apart; to vary the mount and frame so as to help the subject; to carry out some idea of your own, so that, as far as possible, *the spectator may forget that he is looking at a show-case or window*, and may be disposed to think it is just a pleasant corner of a cheerful room, where there happen to be several really nice photographs displayed. Where you introduce china, bronze, or any other object of interest—carved ivory, a miniature or two, &c.—let everything you show be *genuine* and *real*—beyond suspicion.

If you adopt the album idea, let the book be a good one, and not disfigured by *pictures* (?) all over its pages. If you take up the bracket idea, don't forget to change your prints in the under panels. If you go in for landscape work, try and work out a few ideas of your own. There are many ways in which little landscape "bits" might be worked out—as, for instance, menu-holders, banner-screens, lamp-shades, hand fire-screens, letter-weights, &c., &c.

However, in all such matters it is always well to bear in mind the great and fundamental principles of decorative art—viz., that in striving to introduce beauty, we must always remember the *nature* of *material* with which we have to work, the *place* which the object is destined to occupy, and, lastly, the nature of its *office*. With these three ideas present, each may safely be left to work out his own ideas.

---

London and Provincial Photographic Association.—May 7th, "Toning Bromide Paper," J. Weir Brown; May 14th, last lantern night of the season.

Photographic Club.—Subject for May 6th, "Outfits for Landscape Work"; May 13th, "New Hand-Cameras." Saturday outing, May 2nd, Twickenham to Richmond; leave Waterloo Station 2.17, meet at Twickenham at 3 o'clock.

Mr. Thomas Widdop, Hon. Secretary of the Oldham Photographic Society, sends us a neatly got-up card containing a list of the places to which rambles will be made by the members during the ensuing season. A novel feature of the programme is a portrait of the president (Mr T. Heywood), surrounded by miniature copies of various products of his busy camera.

Messrs. C. Schleicher and Schull, of Düren, Rhenish Prussia, Germany, are now manufacturing filtering papers of a novel kind, which possess, even in a damp state, a hardness and durability approaching that of parchment. They will stand a pressure of three atmospheres, and will retain the finest sediments. Such a sediment can be scraped off and the filter paper used again and again.

## ARCHÆOLOGICAL PHOTOGRAPHY.

[Editorial Note.]

Some time ago, the sculptured Gothic arches referred to last week were pointed out to us, and we were definitely told that they formed the entrance to an ancient oratory. Upon examining them closely, however, we were convinced that they were merely cut upon the surface of the sandstone, and that no cavity existed behind them. We were led to this conclusion from observing that the natural bedding lines of the rock were continued within the spaces enclosed by the arched lines and their supporting pillars, and that, in the central arch, a crevice above is continued downwards, and in reality causes a gap in the crown of the arch itself. But our informant was so positive that a cavity existed behind, which had been subsequently bricked up, that we communicated with the rector of All Saints' Church, which lies immediately below the hill where the arches are situated. In his most courteous reply, he writes: "I presume you refer to the arches on the hill to the south-east of the churchyard. These were cut on the solid rock, at the instance, as I have understood, of an old gentleman who lived on the opposite hill, and who wished to have a picturesque view from his garden. These, I suppose, were made nearly, if not quite, a century ago." He then goes on to point out the situation of the ancient oratory already referred to.

Another correspondent gives a totally different origin to the mysterious arches, and traces them to a family of the name of Coussens who held the Old Ship Inn at Hastings (now pulled down) more than one hundred years ago, and he was kind enough to send us an extract from a paper which he had contributed to the *St. Leonard's and Hastings Gazette*. This runs as follows:—

"But just a word or two about the father, who was better known by the soubriquet of Navarage than by his baptismal John. He was one of a party who used to arrange for occasional syllabubs, which consisted of meeting in the open air, to drink rum and milk, and to sing songs; and, having discovered a convenient spot on the west side of the East Hill, he and his sons marked the said spot by chiselling out on the face of the rock a triple design of pointed, arched doors, resembling those of churches. Here they and their friends caroused to their hearts' content whenever they bethought them to celebrate some event of a national character, or some particular occurrence in their own families. A milkman of the name of Robin Foster was he who supplied the milk, whilst the rum (or brandy, if sometimes preferred) could usually be obtained from those whose practice it was to get it duty free. These imitation doors were kept painted for many years by the Coussens family, who, with their friends, would sometimes talk of going to church when bent upon a debauch of rum and milk. Whether permission to form those door panels was ever obtained from Sir Godfrey Webster or Mr. Milward, the successive owners of the hill, this deponent sayeth not; but that the three "black doors" have continued to this day—a puzzle to visitors and residents alike—needs but a glance in their direction to demonstrate."

It seems hardly probable that men who were addicted to illicit drinking should have taken the trouble to carve out these arches, even if they possessed the necessary skill to execute the work. The arches are correctly formed, and at least a couple of tons of stone must have been removed in their construction. If they had merely wanted to mark the site of their revels in any way, surely they would have contented themselves with describing the arches with paint pot and brush. We are inclined to agree with the writer of the foregoing article in believing that the doors have an ecclesiastical origin. The question still remains an open one.

## Notes.

"Art in relation to photography," although a subject which of late years has been much discussed and written about, is one upon which many photographers have very hazy ideas. Those who wish to bring their mental images of the matter to sharper focus cannot do better than attend a course of four lectures at the Polytechnic in Regent Street. The lecturer is Mr. Valentine Blanchard, whose name is at once a guarantee that he has something to impart to his audience which will be worth the hearing. The first lecture takes place next Wednesday, and the fee to outsiders for the whole course is only one guinea.

An unusually good and interesting set of lantern pictures was exhibited at the Crystal Palace on Friday last. They illustrated the principal ports of our Australian colony, Adelaide, Melbourne, Sydney, and Brisbane, and also made the spectators acquainted with the beautiful scenery of the adjacent districts. The pictures were from negatives by Mr. G. H. Royce, C.E., who has travelled thousands of miles over the vast country, and who took the wise precaution to travel always with a quarter-plate camera as part of his kit. The result is a really valuable collection of pictures of Australian life and scenery.

At the outset we are made acquainted with the shockheaded Aborigines, examples, perhaps, of some of the least intellectual of the great human family. With no ideas of agriculture, building, or any other art whatever, they find that civilisation is a problem which they cannot solve; they are fast dying out, and presently their place will know them no more.

How different is it with the whites. Here we have the picture of a settler who has purchased his holding at the rate of £1 per acre, payment to spread over ten years. He has built a rough hut over his head, and while he leads a Robinson Crusoe kind of life his crops grow up around him, and his cattle multiply. Another picture, that of a well-built residence with outbuildings, shows how industry has rewarded the man, for he is now a prosperous farmer.

There were also shown photographs of towns which have sprung up like magic around some formerly desert place where mineral riches have been developed. Take, for instance, a certain one with 20,000 inhabitants, which has grown up round a celebrated silver mine. Six short years ago the place was a waste, and no human habitation was within miles of it. But silver was found here, and the mine was developed with such success that the metal already extracted has been valued at four millions sterling. Other pictures deal with gold mining, sheep farming, sugar growing, and other Australian industries. If all travellers were as successful in their photographic operations as Mr. Royce has been, the old adage which says that "one half the world knows not how the other half lives" would soon cease to have any meaning.

The ease with which an etching can be imitated, copied, and reproduced by photographic methods was certain, sooner or later, to raise the question whether certain works were or were not due to mechanical means rather than to the hand of the etcher. Professor Herkomer has been the first victim to suspicion of this kind, and he complains that "baseless insinuations have been made, and it has been openly stated that these illustrations—those of his recent work, 'An Idyll'—are nothing more than prints from so-called process blocks or photogravures." The professor has hitherto been content to remain silent under this trenchant criticism of his works, but as silence, in these days, is often misconstrued, he at last comes down upon his "self-constituted judges."

He tells them that apparently they do not know the difference between a dry point etching, an etching produced by biting in, and an etching which has as a basis a pen line drawing mechanically transferred to the plate as a preparation for further etched work, executed in the usual manner. He tells us that in his book there are examples of all three methods, and that he has used no other; further, that these are means which, he considers, any conscientious artist is fully entitled, on honourable and artistic grounds, to practise, and we are promised, in his forthcoming lectures at Oxford, to hear more as to the details of these methods of working.

A correspondent of *La Nature* describes a very pretty process for the production of a photographic menu-card. He is an amateur, and when he gives a dinner party he offers his guests a photograph of the house in which they are sitting, or the scenes which they are going to visit if it is the case of a picnic, and on this photograph appears the menu and the name of the host and hostess. All that he does is to block out a sufficient space on the photograph on which he can write the menu, and print it on paper which takes ordinary ink. A platinotype print answers admirably.

A very novel effect in connection with photographs of machinery is described in the American *Manufacturer and Builder*. The example which our contemporary gives presents the two sides of a piece of machinery in one picture. The method followed was to place the machine before the mirror inclined at such an angle that the reflected image of the back of the machine, and the direct image of the front, when photographed together should appear superposed in the picture. The result is seen in the engraving referred to, in which the front and back are obvious at a glance.

Very little notice, it seems, is taken in America of copyrights in mechanical designs by those most interested. It is the current practice in the machinery trades that, unless the designs be wholly novel, little, if any, objection is made to infringement by photography or otherwise, provided that the person who so infringes suggests an "improvement."

A leading manufacturer lately said that, even where one of his draughtsmen leaves him and goes to a rival house, carrying many ideas to be worked out with close resemblance to the original designs, it scarcely pays to fight. So long as this laxity is confined to American designs, it does not very much matter. We are afraid, however, that American designers have the same views regarding English designs. It is a well-known fact that American inventors are diligent searchers in our Patent Office.

They have peculiar ways in Jassy, the Roumanian capital. The distinguished French sculptor, Fremiet, was commissioned in 1881 by the Roumanian minister in Paris to make a colossal statue in bronze of Stephen the First, for which he was paid £5,250. The statue was in the *Salon* of 1882, and afterwards set up in Jassy. "It is now," says an aggrieved writer on Fremiet's work in the *American Architect and Building News*, "well out of the world, as is amply proved by the fact that after some two years of persistent effort it has been found impossible to persuade a Jassy photographer to make a picture of it." Why? Is it the fault of the photographer, or of the municipal regulations?

The bogus photographic club is so easy a swindle, that the wonder is it is not more frequently practised. The latest example comes from the West London Police Court, where a man has been charged with obtaining money under the pretence of taking people's photographs. "The West London Photographic Club" was the inducement put forward, and the prisoner seems to have worked the business pretty successfully, for no less than three hundred persons are said to have been victimised. To carry out the swindle properly, it is necessary to have a studio, and this the prisoner provided himself with, but he does not seem to have been able to take a portrait. This, of course, was of no consequence, as, to the majority of sitters, photography means being told to "smile and look pleasant," while the photographer stands solemnly by with something like the lid of a collar-box in his hand. This ingenious individual was, however, not satisfied with taking in his sitters, but he must needs take in a brother photographer—an unpardonable act. He sold the business, and on the purchaser commencing to work, the crowds of indignant persons clamorous for their photographs revealed the fraud. To this, at least, the evidence seems to point.

Few who look upon Mr. F. Sargent's picture of the Jubilee Garden Party at Buckingham Palace, now on view at Messrs. Graves's, Pall Mall, can form the least idea of the immense labour the work has involved. There are nearly four hundred figures represented, and, as all are portraits, the difficulty not only of obtaining the likeness, but—a far more important matter—of pleasing the originals, must have been enormous. Of course, without the assistance of photographs, such a task, so far as accuracy is concerned, would have been almost impossible. One cannot but admire the adroitness with which Mr. Sargent has overcome what might have been the cause of considerable heart-burning. The only unrecognisable portraits are those of the two ladies who are being presented to her Majesty. This reminds one of the common expedient to which artists are compelled to resort when they have to draw scenes at which they have not been present. If a man whose portrait is unobtainable is to be in the picture, he is always drawn with his back to the spectator.

The picture in the following column is an engraving from an instantaneous photograph by M. Reutlinger. We insert it as a good example of the making of a pretty picture from very common materials. Kittens are certainly not rare animals, and are naturally objects full of graceful movements and attitudes, and a bottle and glass funnel is always at hand in the photographer's laboratory. A glimpse of the picture inspired a friend of the PHOTOGRAPHIC NEWS to write the lines which now appear with it.

## MISCHIEF IN THE GLASS.

BY J. C.

Minx-eyed puss! with roguish glance
Blinking at thine own mischance,
Thy soft footsteps on the shelf
Have erratic led thyself
To mischief in a glass.

So do freaks of fate betide
Endlessly the whole world wide,
And fantastic fortune plays
Many parts in many ways
Of mischief in the glass.

Proudest queens of beauty's reign,
Cloyed of love and lovers slain,
Seek the chamber's fairest nook,
And, in tranquil moments, look
At mischief in the glass.



Still a nobler phase we find
In the healer of his kind;
Yet, not seldom, even he
Has declared his skill to be—
But mischief in the glass.

Now, to him who's next in view,
Sad pre-eminence is due.
He's a chief midst those who are
Called too often to the "bar"
By mischief in the glass.

And, oh! student of the lens,
Claiming meed from many pens,
Think, when chemicals betray,
And the tear is dashed away,
'Tis mischief in the glass.

## COLOUR.*

BY W. E. DEBENHAM.

It seems strange, considering the universal recognition of colour as distinguishing various objects, and the amount of gratification which is afforded by the variety of colours of natural objects, that so many ages have passed by with so little investigation of the subject. Indeed, what has to be told concerning colour is the result of quite modern investigation. We need go no further back than the time of Newton, who found that ordinary light, analysed by a prism, was compound in its nature, and he divided the colours into which light may be resolved into seven—violet, indigo, blue, green, yellow, orange, and red. It is not easy to see why indigo was included as a distinctive colour, unless it was to make up the magic number seven, possibly because there are seven days in the week, or perhaps from analogy with the science of music, because there are seven notes in the diatonic scale. It is quite possible, however, for a reason which will be given later on, that indigo as a distinctive colour may eventually be endowed with more than its original importance.

The colours of the spectrum owe their variety and their characteristics to the different wave-lengths of the rays of its different parts. When white light is analysed by passing through a prism, a band of colours is seen which does not exhaust the whole of the rays passing, but only indicates what our eyes are fitted to observe. Starting with the less refrangible rays, we see a full set of gradations from red, through yellow, green, and blue, to violet at the other end. Beyond both ends of the visible spectrum are rays of longer or shorter wave-length which are not visible to us. Beyond the red end are heat rays, and beyond the violet are rays which can be recognised by their powerful effect upon photographically sensitive compounds, and can also be rendered visible by fluorescence.

It has been a common observation that, by mixing pigments of certain colours, other distinct colours resulted, and, as it was found that with transparent red, yellow, and blue all other colours could be represented or approximated, these three were naturally supposed to be primary colours. This was, and is, perhaps, in some places, still taught. Strictly speaking, every spectrum colour is primary. Each had its own wave-length, fixing its place in the spectrum, and indicating characteristic properties of heating or chemical effect. To understand why some colours have the effect of being compounds of others, we must turn our thoughts from the colours themselves to the consideration of the human eye, the instrument for perceiving them. According to the doctrine first put forth by Thomas Young at the beginning of this century, and now generally accepted, there are in the eye, distributed over the retina, three sets of nerve fibres, one sensitive especially to red, one to green, and one to blue or violet. Each set is sensitive over a considerable range of the spectrum; thus, the red and the green fibres are both sensitive over the yellow region, whilst the green and blue sensitive nerves respond to what is between them, and the blue or violet set is sensitive from the extreme end of the visible spectrum. Each set is thought to be sensitive, more or less, to a great length in the spectrum, but to have a maximum at some particular place in it, corresponding in one set to red, in another to green, and in the third to blue or violet, or a point between them. Maxwell gave blue as the colour to which this set of nerves is most sensitive, but the experiments of Helmholtz confirm those of Muller, which give violet as the colour to which the special set of nerves particularly correspond. Abney considers the place as that of the spectrum line G. The reference made in the beginning of this paper to the possible reinstating of indigo as a primary colour was suggested by the idea that that place might, perhaps, be eventually decided upon as the maximum of sensitiveness for the blue or violet set of nerves, and the name, which is neither blue nor violet, but is distinctive, might be conveniently adopted. Helmholtz, however, said that the precise tint of the maximum of sensitiveness cannot possibly be known by experience. This is not very important. We know approximately the range of sensitiveness of each set of nerves, and pretty nearly the place of maximum sensitiveness.

As to direct anatomical proof of the existence of these three sets of nerve fibres corresponding to the primary colours, none has yet been found in the human eye, or in that of mammals, and this, perhaps, because of the exceeding minuteness which must characterise them in order that we may see minute objects of various colours all over the retina without distinguishing the separate areas for the various tints. In the eyes of birds and reptiles, however, Helmholtz tells us that Schultze found rods or tubes of three kinds, one filled with red oil, one with yellow, and one set colourless. The red would obstruct blue and green rays, whilst the yellow would obstruct the blue, and the colourless rods permit all rays, including blue and violet, to pass.

Primary colours, then, have no existence, except with regard to our sensations of colour, and these are three—violet-blue, green, and red. These three are the primaries, and from them we may compound a sensation answering to any part of the spectrum. The yellow of the spectrum affects both the red and the green sensitive nerves, and it is the combination of sensations transmitted to the brain by these two sets of nerves that gives the sensation of yellow. It should, therefore, be found that green and red simultaneously acting on any portion of the retina will produce the effect of yellow, and this is actually the case. I throw on the screen an image of a green disc from one lantern, whilst with another a red image is projected upon the same spot. The effect, it will be seen, is yellow. It must not be expected that, with the colours available for the purpose, the compound tints will be perfectly pure and brilliant. In the first place, I have not been able to obtain dyes which let through only one particular spectrum ray, and exclude all others. Anyone who has worked with the spectroscope will know that almost all the colours procurable are far from pure, that is to say, that they let through light from a considerable range along the spectrum, and sometimes from two widely different parts. Aniline blues and greens, for instance, generally allow a good deal of red to pass. Farther, we judge a colour very differently according to the presence of other colour wherewith to contrast it. To quote Helmholtz once more: "We know in a general way that candle-light is yellowish compared with daylight, but we only learn how to appreciate how much the two kinds of illuminations differ in colour when we bring them together at the same intensity, as, for example, in the experiment of colour shadows. If we admit light from a cloudy sky through a narrow opening into a dark room, so that it falls sideways on a horizontal sheet of white paper, while candle-light falls on it from the other side; and if we then hold a pencil vertically

* Lecture given at the London and Provincial Photographic Association.

upon the paper, it will, of course, throw two shadows; the one made by the daylight will be orange, and looks so; the other, made by the candle-light, is really white, but appears blue by contrast. The blue and orange of the two shadows are both colours, which we call white when we see them by daylight and candle-light respectively. Seen together, they appear as different and tolerably saturated colours, yet we do not hesitate a moment in recognising white paper by candle-light as white, and very different from orange."

(*To be continued.*)

## Patent Intelligence.

### Applications for Letters Patent.

6,762. FRANZ SCHRAIVOGEL and MAX HERING, 67, Bensham Grove, Thornton Heath, London, "Proceeding and Apparatus of Half-Tint Decomposition for the Production of Photographical Netting Plates of Half-Tint in Hatching and Grain for Clichés of High and Low Pressure."—April 20th.

6,800. THOMAS BEAVEN SLOPER, 323, High Holborn, London, "Improvements in the Binding of Photographic Albums, Pattern Cards, Music Sheets, and the like."—April 20th.

6,838. JOSEPH PETTINGALL, 18, Pellerin Road, Stoke Newington, London, "The 'Bellolux' or Tourists' Collapsible Dark Room Lamp."—April 21st.

6,845. GEORGE JONES, 323, High Holborn, London, "Improvements in Photographic Roll-Paper Holders."—April 21st.

6,864. THOMAS RUDOLPH DALLMEYER, 4, South Street, Finsbury, London, "Improvements in or connected with Focus Finders, chiefly designed for Photographic Purposes."—April 21st.

6,921. HENRY KUHN, 52, Chancery Lane, London, "Improvements in Photographic Mounts."—April 22nd.

7,057. JOSEPH PARKINSON, South Regent Street, Lancaster, "Improvements in Photographic Shutters."—April 24th.

7,186. HENRY WILKINSON, Massey Park, Liscard, Cheshire, "A New Developing Dish, with Cover, for Photographic Plates and other Sensitive Material."—April 25th.

7,201. HENRY MONTAGUE WILSON, 60, Chancery Lane, London, "An Improved Shutter for Photographic Cameras."—April 25th.

### Specifications Published.

17,522. *November 4th*, 1889.—"Photography." V. J. E. DAMOIZEAU, 17, Rue St. Ambroise, Paris.

Relates to apparatus for taking in any desired angle, or the entire horizon, for producing panoramic views for plans, landscapes, &c. The apparatus is also applicable generally for photographic purposes, when sensitive material is wound on rollers or bobbins.

*Cameras and Roller Slides.*—On a platform, which constitutes the top of the stand, a revolving carriage is pivoted, and is provided with rollers, and an actuating disc worked by clockwork. The disc also actuates a drum, which actuates the sensitised film stretched over the holding bobbin, and receiving or taking-off bobbin. The rate of movement of the film is in proportion to the distance travelled over by the focal plane of the lens, due to the rotation of the carriage. A differential indicator or counter serves to register the quantity of sensitised paper used. A division between the negatives is pricked by a pricker, actuated by a spring on a movable board at the back. The front and back are mounted on slides actuated by a pinion. The lens board is adapted for horizontal and vertical adjustment. To adjust the optical centre of the lens, in relation to the centre of rotation of the apparatus, a screw is used. The back can be opened to insert and remove the bobbins.

*Sensitised Plates and Films.*—To dispense with a change box, the film has a piece of black paper attached at each end, which protects the roll from light.

*Lens Fittings.*—The lens case has an opening closed by a sliding shutter for removing and inserting different lenses.

*Shutters.*—The sliding shutter has a rectangular opening, and is actuated by the lever, which also releases and arrests the clockwork by which the apparatus is rotated. A second shutter, worked by hand through sector gearing for regulating the time of exposure, is also used.

17,548. *November 5th*, 1889.—"Photography." F. BEAUCHAMP, "The Poplars," Chadwell Heath, Essex.

Relates to *Cameras and Change-Boxes.* At the back part of the camera are two receptacles formed by a partition for the storage of the plates before, during, and after exposure. The plates are provided with a sheath having flanges along three of its edges, or a spring to grip the plate. They are placed in one of the receptacles for exposure, being passed through a door at the back. When the front plate is exposed, it is withdrawn into the chamber by a hooked lever. The lever is mounted on a spindle, which is actuated by a crank handle. The movement of the spindle also actuates a star or ratchet wheel, connected with an indicator by means of pivoted levers. The front is adjusted for focussing by racks and pinions, or by levers on a rocking shaft, which pinions and levers actuate rods or tubes in the front, which slide in tubes in the back.

17,708. *November 6th*, 1889.—"Photographic Cameras." T. R. DALLMEYER, 25, Newman Street, Oxford Street, London, and F. BEAUCHAMP, Hope Cottage, Whalebone Lane, Chadwell, Romford, Essex.

The bellows is strengthened or supported to prevent sagging by an internal spring, the convolutions of which lie within one another when folded. The spring may be in one continuous piece, or in sections.

17,773. *November 7th*, 1889.—"Photography." E. H. FARMER, 309, Regent Street, Middlesex.

In chromo-gelatine processes for producing phototypes and photo-mechanical printing surfaces, it is found that silver has the same effect as light in rendering the gelatine insoluble. To produce the surface, a silver image is obtained on an unhardened gelatine film in the ordinary manner, and the film or plate is then immersed in a solution of ammonium bichromate. For the gelatine corresponding colloids may be used.

17,998. *November 12th*, 1889.—"Photography." T. COLLEY, 18, Lansdowne Circus, Leamington.

Relates to dark slides and cameras.

*Dark Slides.*—The dark slides, which may be adapted to carry one or more plates, have weighted shutters or doors hinged at the bottom, and secured by fastenings at the top. They are provided with grooves at the sides for insertion vertically into a swing frame pivoted in the camera.

*Cameras.*—The camera may be of the instantaneous kind, or of any other kind in which there is room for the rotation of a swing frame, into which the dark slide is inserted and secured. The frame, which also carries the focussing screen, is provided with an indicator by which the position of the frame can be known when the lid is shut. When the frame is inclined from the vertical, one of the doors, previously unfastened, falls down to expose the plate. The camera is adapted to store or carry a number of the dark slides. A shutter at the back is opened for focussing.

18,224. *November 14th*, 1889.—"Photography." H. G. M. CONYBEARE, The Hut, Ingatestone, Essex.

*Shutters.*—Tapes or bands are attached to rollers, and pass over a third roller, all of which are enclosed in a case having exposure apertures in the front and back. To the tapes is secured a piece of cloth, which serves as a blind. The roller is actuated by a spring, the tension of which is regulated by a ratchet and pawl. To set the shutter, the tapes are wound on one of the rollers until the aperture is covered by the blind. The roller is then arrested by a pawl, which is released by a pneumatic arrangement.

18,167. *November 14th*, 1889.—"Photographic Shutter." W. J. LANCASTER, Colmore Row, Birmingham.

One form of the shutter is adapted for slow or rapid exposures. It consists of two slides with exposure apertures, and which coincide in front of the lens aperture. The slides are connected to opposite ends of a lever. For slow exposures a stop lever is turned down so as to hold the shutter open as long as pressure is kept on the piston by the pneumatic ball; when the pressure is released the shutter closes by gravity.

In another form of shutter the time of exposure is regulated by clockwork. There are two slides, caused to move in opposite directions by a lever, as in the previous case, but actuated by springs. One of the slides is caught by a detent when the shutter is open ; the clockwork is started, at the same instant, by contact with the slide, and releases the detent holding the shutter after the lapse of the required time'

18,583. *November 20th*, 1889.—"Magic Lantern." A. HUGHES, 59, Fenchurch Street, London.

Relates more especially to the multiplex lanterns.

The bodies of the lanterns may be made of various materials, but, preferably, mostly of aluminium, the fronts being collapsible leather bellows instead of brass tubes as usual. The bodies are carried on brackets swivelled to sockets, which slide on uprights, and may be clamped in any required position by screws. By the above arrangement, and by means of connecting the lanterns, or the lowest lantern, and the base-board by adjustable telescopic tie-rods, the whole lantern bodies may be moved in order to bring them into position for registering on the screen, and consequently the objectives are not thrown out of the optical axis. The fronts are opened out by means of rods sliding in tubes, and racked so as to be operated by pinions on arbours. The condensers are mounted in a frame fixed upon the bottom frame, and the body of the lantern, with the lamp rigidly attached, slides on the frame, and may be fixed in any required position relatively to the condensers by screws.

18,547. *November 20th*, 1889.—"A New or Improved Compound or Developer for Use in Photography." BENJAMIN JUMEAUX, 11, Brighton Place, Stretford, in the County of Lancaster, Artist.

This invention relates to a new or improved compound for use in photography as a developer, consisting of eikonogen, chlorate of potash, and sulphite of soda, used in the form of a solution. These ingredients may be used in the following proportions, namely :—

| | |
|---|---|
| Eikonogen (powdered) ... ... ... | 2 drachms |
| Chlorate of potash (powdered)... ... | $1\frac{1}{2}$ ,, |
| Sulphite of soda (powdered) ... ... | 3 ounces |

which are slightly damped and mixed together, and then dissolved in one pint of hot water. The above proportions are those considered to give the best results ; but they may be varied or modified more or less without departing from the invention. For example, the quantities of the chlorate of potash and the sulphate of soda might be either slightly diminished or increased with the same weight of eikonogen.

The chief advantages obtained by this new or improved compound are, that it is self contained—that is to say, it requires no accelerator ; it will develop well with negatives of all makes, opals, lantern slides, and bromide papers, and does not stain either the hands of the operator or the plate except after repeated use, when it will slightly stain paper or opal.

18,689. *November 21st*, 1889.—"Photography." B. ACRES, 131, Richmond Road, Hackney, London.

*Washing Prints* —The print is enclosed in two frames hinged at the base and secured at the top by a clasp, &c. Transverse bars in the one frame are put on so as not to touch the bars in the other. The frame is provided with projections to rest on the tanks, &c.

---

*The Press*, a newspaper which is published at Christchurch, New Zealand, gave in its issue of March 10th, which has just reached us, some account of the doings of the Photographic Society there, from which we gather that quite an active organisation exists in that far-off land. We learn that "the annual general meeting of the above took place last night, when the officers for the ensuing year were elected. After the general meeting, a gathering of the friends of the members, including several ladies, was held. The work of the members of the Society, which was exceedingly creditable, was displayed, and Mr. Seager gave an exhibition of slides by the oxy-hydrogen light. There was also a student's lamp provided of the ordinary pattern, to enable any who desired to do so to exhibit their own pictures. A very pleasant and enjoyable evening was spent by those present."

# Correspondence.

## THE PROFESSIONAL ASSISTANTS' ORGANISATION.

SIR,—Will you give me space for a report on the proposed organisation of photographic artists and assistants ?

Some of our friends are under the impression that we are on the high road to success, while some of our opponents are jubilantly asserting that we are defunct. They are all mistaken ; we have both succeeded and failed—succeeded in securing numerous applications for membership, but failed to secure the class of workers we want. We started this movement with the object of drawing into a business combination all the best in every way of the photographic artists, and we would sooner give up the movement altogether than secure for ourselves a false importance by means of a number of imperfectly skilled members. It stands to reason that if we expect the countenance and co-operation of the employers generally, we must offer *quid pro quo* ; we must be in a position to guarantee that they shall not have duffers and frauds forced on to them by our organisation. This guarantee we strove to effect by instituting qualifying restrictions on membership ; but, out of fifty applications sent in, not more than eight could satisfy our technical requirements. A similar report has been sent us by the provincial secretaries. What does this show ? Not only that there is a large number about of useless workers, but also that the worthy artists persist in standing aloof from our scheme.

We are now simply *in statu quo*. We cheerfully and confidently await the day when the professional artist will arouse himself from this lethargy, and seek in judicious and temperate combination a remedy for the encroachments which threaten the position of his profession, both from above and below. What are his objections to our proposed society ? Briefly, as follows :—

1. "Combination with the object of securing improvements in salary and hours of business has been associated with so many debasing incidents in the recent history of the country, that the professional should hesitate to stoop to similar means."

2. "The programme, rules, manifestoes, speeches, and general tone of the proposed 'Union' were of too aggressive, bitter, and vulgar a character to commend themselves to professional men."

A thousand other details have been raised by those who should rather have aided the improvement of our movement by suggestions of a practical and sympathetic character. For instance, there were objections to the financial estimates of the organisation, but I will only deal here with the above criticisms :—

1. If any of the methods of unionism have been low and degrading—though it would be hard to prove to the poor, ignorant workman that he is degraded by the shorter hours and extra cash obtained thereby—is it necessary that all combinations must be carried on on the same lines ? A coal-porter's strike is probably not the most refined of class struggles ; but does it follow that a request for, say, increased salary by lithographic artists or clerks, who are also organised, will be anything but a dignified and gentlemanly negotiation ?

2. If our proposed rules, or our methods of giving publicity to them, seemed aggressive, it must be remembered that all new movements have the unfortunate habit of over-estimating their own importance. If one reads the reports of early meetings of the new master-photographers' organisation, he becomes conscious of the same aggressive egotism. This is not always intentional, and I repeat here that our object always has been, as our motto says, "Defence, not Defiance" ; and that it shall never be otherwise.

Again, if the professional workers disapproved of any of our proposals, they could have amended them by joining the organisation, as the objects, rules, and working methods will always be entirely subject to the opinion of the members ; in fact, will be formulated by them.

One objection has been forcibly urged in face of our persistent explanations. Our scale of wages has been denounced as being far too low ; whereas, in reality, it was not intended as a schedule of fair wages, but as a notification that nobody would be admitted as a member who earned less than the wages named. As events have proved, the scale was too high rather than too low for the majority of applicants.

There is no doubt that the time is approaching when the increase of competition will drive home our policy with sterner logic than any arguments of ours possessed. The time is not so very distant when the position of those who earn their living by photography will become incomparably worse than it is now ; and I am sure that then they will make a resolute and spontaneous attempt to unitedly improve their lot. Let them look to it that they do not defer their activity until the wave of competition becomes irresistible. I do not doubt that even to the last there will be some who will persist in clinging to their shibboleths of "gentility," preferring to starve in the odour of professional sanctity rather than risk by organisation the appellation of "workmen."

We shall continue to agitate and educate. We are now considering a scheme of amalgamation with the lithographic artists, which would result in a large accession of strength to our movement, from the services of their organisers. The present year will be spent in putting in our foundations.

*Maidstone, April 27th*, 1891. Arthur Field, *Hon. Sec.*

## NEW SOCIETY FOR BIRMINGHAM.

Sir,—At a preliminary meeting, held at the Colonnade Hotel, New Street, on Wednesday night, April 22nd, it was resolved that a photographic club or society be formed, and a provisional committee, consisting of Dr. Leech (chairman), Dr. Hall Edwards, E. Morton, C. R. Lunn, Dr. Mabberley, and Walter D. Welford (hon. sec.), was appointed to draft out a code of rules, and make the necessary general arrangements to be placed before a general meeting for adoption, to be called at an early date. The ideas of the provisional committee are that the name should be the Midland Camera Club, and that the platform of the club should be as follows :—

The advancement of photography in all its branches, and the promotion of social intercourse between all photographers.

1. By the holding of periodical meetings for lectures, papers, discussions, practical demonstration, and friendly competition in photographic subjects.

2. By the provision of club rooms, with dark rooms and other conveniences for the use of members.

3. By the promotion of intercourse between this and other societies.

It is proposed that the work of the club be divided into the following sections:—Scientific, Archæological, Lantern, Cycling and Touring, Ladies, Instruction of Beginners. Each section to hold their own meetings and appoint their own officials. General meetings will be held monthly, probably on Tuesday or Friday nights. The committee think that much detail work could be done by the sections, leaving the general meetings free for lectures, lantern exhibitions, &c., and in this respect the new club will go outside its own ranks to other societies, and thus promote friendly intercourse.

Club rooms have already been secured in a central part ot the town—one fair size for meetings, and two smaller ones attached for dark rooms. For lectures and lantern exhibitions a large hall, holding 200 to 300, will also be at their service.

These plans are, of course, not definite as yet, being subject to a general meeting, but they convey the ideas of the promoters. Walter D. Welford, *Provisional Hon. Sec.*

## PRINTING ON ALBUMENISED PAPER.

Sir,—Considering the rapid strides that have been recently made in the various photographic printing processes, it is a little surprising that the old and well practised method of printing on albumenised paper should still remain so imperfect. The double and brilliant albumenised papers now in the market are advertised as giving "perfect" results ; but the makers have not yet overcome the cause of blistering, which personal experience has shown in many instances takes place immediately they enter the fixing bath, or, in some cases, later on and during the washing. This, notwithstanding that every precaution being taken as recommended by the various vendors—viz., liq. ammonia in some cases, in others chloride of sodium, &c. The albumen which "blisters" is found only on the "highly" surfaced papers, and although they produce a uniform and brilliant print, the amount of waste and annoyance caused, I think counterbalances the advantages over the less highly albumenised surface. Some may think blisters of little consequence, as they go down (unless broken) in the mounting, but as soon as the hot-roller or burnisher is used they reappear, and thus labour is lost, and all ends in disappointment to the photographer as well as his customer. Why not use the single albumenised papers which do not blister? some would say. To this I would reply, from long practice, I find the surface so uneven that several prints from same sheet of paper and negative differ greatly, the thin albumen end producing a mealiness, whilst the upper or most brilliant part produces a richer print.

What photographers appear to be in want of is a good, reliable, and uniform albumen paper, for, although there are many new printing processes, the old one is still more in demand than any other, and from all appearances is likely to be for many years to come for small work.

Surely many photographers have experienced similar annoyances through these dreadful blisters, and if any certain cure is possible, would gladly and gratefully welcome it. It is useless the makers advertising their papers as giving "perfect" prints, "no blisters," because a trial sheet is sufficient, and further business cannot be expected. The writer would like to hear the experience of others in your valuable journal, to the edification of the profession generally. J. Smith.

*April 27th.*

# Proceedings of Societies.

### The Photographic Society of Great Britain.

At the technical meeting of this Society, held on the 28th April, the chair was occupied by Mr. T. Bolas.

The subject of the evening was "Animal Photography," and it was with regret that the Chairman read a telegram from Mr. Gambier Bolton saying that he was unable to leave Windsor Castle so as to be present. Letters of regret were also read from Mr. Marey and from Mr. R. Dresser.

Mr. F. Haes showed a number of slides of animal life taken about the year 1864 in the Zoological Gardens on wet collodion plates. *Apropos* of a picture of the quagga, he said that it was a mistake to suppose that the animal was extinct. He had recently received a letter from a well-known hunter in Mashonaland, who said that he saw plenty of them.

The Chairman said that the collection shown by Mr. Haes was a most interesting one. It should be borne in mind that these negatives were not taken with the advantage of modern rapid processes, but on wet collodion, with which, besides the much greater length of exposure required, there was the inconvenience that each plate had to be prepared as wanted, and these might be spoiled by keeping whilst waiting for the opportunity to take the photograph. There was one particularly of Mr. Haes' pictures of a lion which he thought would compare well with more recent photographs taken with modern advantages.

Mr. H. Sandilands showed a number of slides representing mostly pastoral scenes, and some of animals belonging to a circus.

A collection, by Mr. R. Wainwright, was next exhibited. The negatives had been on $7\frac{1}{2}$ by 5 plates, and the slides made by reduction in the camera upon ordinary bromide plates.

A single slide of great beauty was shown by Mr. T. E. Freshwater.

Mr. J. J. Bright showed a series of slides of domestic animals.

Mr. Lewis Medland exhibited a number of slides of animals, and followed this series by one of photographs made from illustrations of animals, such as were to be found in works on natural history, before photography had had an influence in the matter. Particular attention was called to a slide representing Buffon's idea of a lion.

The Chairman asked for a discussion, which was opened by Mr. W. E. Debenham who pointed out the influence that the photographic representations of animals by Muybridge and others had had upon modern painting and illustration. In the modern French school particularly, the attitudes of the horses in battle subjects were very different from, and much more varied than, those which were thought to suffice up to some twenty or thirty years since. If the illustrations, too, of racing and hunting subjects in the period of the present time were compared with those of the past, the influence of photography in supplanting the few old conventional types of running and jumping horses would be plainly evident.

Mr. Haes thought that many of Muybridge's representations were useless to artists, the positions were so *gauche* and ugly. There were some, however, that were very useful. It would be a great convenience if there was some sort of explanatory index of Muybridge's photographs.

The Chairman said he supposed Mr. Haes meant by ugly, that the photographs referred to were untrue. They were untrue in the sense that they represented phases of motion too quick to be seen. What the eye saw was a resultant of several positions.

Mr. Haes said that the positions he spoke of were useless to artists, although perfectly true. They were so ugly. There were several curious points that he noticed in closely watching the positions of a galloping horse. One was that the legs were at one time closely doubled up under the animal. Another point was that the feet were never in front of the head, although in paintings they had commonly been represented in that position. He had noticed that most people would be deceived as to the proportions of a horse, and if asked the number of heads the animal was in height, would give too many. The actual height to the withers of a horse was about two and three-quarter heads. He thought there were only two proper forms for representing animal life in photography. One was by means of the stereoscope, and the other by lantern slides. He advocated photographing animals in front of a background marked with measures, so that the proportions might be studied.

The Chairman said that he was pleased that Mr. Haes had spoken in favour of stereoscopic photography, a department which had been too long neglected, although there were indications, to some extent, that it might be revived.

Mr. Sandilands said that Mr. Debenham was rather severe on artists of the past with regard to their representations of animals. He thought it would be difficult to produce better pictures, or pictures more true to life, than some that he could call to mind.

Mr. F. Chang showed some slides of animal life, and, after votes of thanks to the exhibitors of the various slides, and to Mr. A. Mackie for working the lantern, the meeting terminated.

It was mentioned that at the meeting of May 12th a paper on "Polychromatic Impressions by Photography" would be read by M. Léon Vidal. At the technical meeting on May 26th, the subject of "The Influence of Development on Gradation" stands for discussion.

### London and Provincial Photographic Association.

*April 23rd.*—Mr. A. Mackie in the chair. Mr. Low Sergeant and Mr. H. D. Gower were elected members of the Association.

Mr. W. E. Debenham read a paper on "Colour" (see page 338). The lecture was interspersed with illustrations showing the effect on the screen of superimposing one colour over another, the effect being contrary to the generally accepted theory with regard to the mixture of colours. Two lanterns were employed; from one, a red disc was projected on the screen; from the other lantern a green disc was then projected, which produced a yellow colour. In the same way, yellow and blue produced a pale yellow tint, and a mixture of red, blue, and green produced white light. Mr. Debenham also passed round slips of black cardboard, pierced with two holes to correspond with the width apart of the two eyes. The apertures were covered with two different coloured pieces of gelatine. On looking through these at a bright light, some curious effects were observable with regard to the colour seen.

A short discussion followed.

### Camera Club.

*April 23rd.*—Sir George Prescott in the chair.

Dr. Patterson showed some binding strips for lantern slides, which he said would stick. They were produced by Schweitzer, of New York.

Mr. Frank Howard then, in a paper entitled "Amongst Byepaths and Field Lanes with the Camera," dwelt on the charm of wandering amongst the beauties of the country, and studying with and without the camera the picturesqueness of rustic people and rural scenes. He gave a few hints as to the most probable way of dropping upon the out-of-the-world picturesqueness which was so fast disappearing. The lecture was illustrated by about eighty slides.

After a vote of thanks to Mr. Howard, slides were shown by Messrs. Austin, Bright, Yale, Hussey, Patterson, and Seyd.

On Thursday, May 7th, Mr. Willis will give a paper entitled "Clam-Chowder."

### Photographic Society of Ireland.

The usual monthly technical meeting was held at 15, Dawson Street, Dublin, on the 23rd of April, Prof. J. A. Scott, M.B., in the chair.

After the usual business of the evening had been transacted, the Boston Camera Club's "Illustrated Boston" set of lantern slides were thrown upon the screen, and admired. The following members also contributed slides:—Messrs. Hargrave, Ruthven, Inglis, and Mathews.

### Holborn Camera Club.

The monthly lantern meeting was held on Friday last, when Mr. T. O. Dear presided.

A number of slides of the Paris Exhibition, lent by Mr. Merne, were passed through the lantern, followed by some from Messrs. Mawson and Swan, showing the various colours, ranging from red to black, obtainable on their lantern plates. Slides by Messrs. Chang, Ebsworth, Gay, Miller, and Thompson, members of the Club, were also shown. The prize for the best "group" taken at the last Club outing, presented by Mr. Brocas, was awarded to Mr. Dear, who announced that he would give a similar prize for the best "group" taken at the outing to Pinner on the 9th of May.

### West London Photographic Society.

*April 24th.*—The President in the chair. Five new members were elected.

The President announced that though the Society had not gained the Challenge Cup at the Crystal Palace, no less than four members had been awarded medals, viz., Messrs. Hodges, Colls, Whiting, and the hon. secretary.

Mr. Blackmore's paper on "Legitimate Photography" was read by Mr. Hodges, the writer having gone to America.

Mr. C. Whiting differed from the opinion of the writer in so far that he considered a certain amount of brush work quite legitimate.

Dr. Low quoted the opinion of an impressionist, that artistic effects could only be obtained by lenses with large apertures, so that the principal object only should be in focus.

Mr. Whiting believed in sharpness all over, and afterwards producing the required effect with collodion masks, which he described.

Mr. Hodges differed from Mr. Blackmore as to the question of flare spot; also as to cutting down prints, and the use of the brush on prints. He saw no harm in doctoring negatives.

Mr. R. Whiting showed a photograph taken with the new automatic machine.

### Brixton and Clapham Camera Club.

This Society held their second annual exhibition of members' work on Friday and Saturday, at Gresham Hall, Brixton. The average quality of the exhibits was higher than that of last year's show. The work in the architectural and portraiture classes evidenced great care and attention. A bronze medal was awarded to Mr. Bevins for his "Coastguard," and certificates to Messrs. Everett and Wilkinson. The award in the class for instautaucous studies fell to Mr. Powell, Mr. Coade comiug in second with a view of "Ramsgate Sauds." The Club's silver medal for the best picture in the exhibition was taken by Mr. J. A. Butler, for an enlarged print from a small negative, "A View in Amsterdam." The president offered a silver medal for the best six lantern slides, and this was also secured by Mr. F. Goldby.

The exhibition was well attended, the eveniugs being devoted to lanteru displays, while, in addition to this, on Saturday evening, a musical programme was provided.

The awards in the competition were as follows:—

*Landscape.*—Bronze medal ("The Grindlewald Glacier"), F. Goldby; certificates ("Is She in Sight?"), F. W. Kent and ("A Brief Rest") F. W. Levett.

*Architecture.*—Brouze medal ("Norman Tower, Christchurch"), F. W. Kent; certificate ("Ruislip Church"), F. W. Levett.

*Instantaneous Work.*—Bronze medal ("Overbacks"), W. H. Powell; certificate ("Ramsgate Sands"), J. W. Coade.

*Portraiture and Figure Studies.*—Bronze medal ("The Coastguard"), W. Bevins; certificates ("A Group of Sailors"), E. J. Everett and ("At Work") A. B. Wilkinson.

*Enlargements.*—Silver medal ("A View in Amsterdam"), J. A. Butler; certificate ("A Stormy Day"), F. W. Kent.

*Lantern Slides.*—The President's silver medal, F. Goldby; certificate, J. A. Butler.

The judges were Messrs. J. Traill Taylor, F. W. Edwards, and A. R. Dresser, while Mr. F. W. Levett, hon. sec., had in hand the general arrangements.

---

### North Middlesex Photographic Society.

On April 25th a number of members took part iu a field-day to Edgware. The first plates were exposed upon Whitchurch, considerable ingenuity being exercised in arranging some cattle to break up the expause of meadow foreground. One very pretty view was obtained by retiring still farther back, bringing the church into the middle distance, and comprising a rushy pool with overhauging trees as the foreground. Stanmore village and church being reached, cameras were directed against every picturesque nook, the population of the village taking much interest in the proceedings. The ruined old church and modern lych gate were taken, and every possible post of vantage having been secured, the party returned to London well satisfied with what had proved a very pleasant day.

On Monday, April 27th, Mr. F. L. Pither in the chair, Mr. Dickenson exhibited and explained the actions of the Radial hand-camera, aud showed samples of eikonogen cartridges. Messrs. Goodhew and Cox reported their test of the plates sent by Messrs. Marion and Co.; and Mr. Taylor showed prints on the chloride of silver emulsion paper seut by Mr. O. Scholzig. A special meeting was then held to elect a presideut iu the place of Mr. Humphries, resigued. Mr. G. W. Marchant was elected.

---

### Hackney Photographic Society.

A meeting was held on Thursday last, Mr. J. O. Grant presiding.

Various books were announced as haviug been presented to the library, which bids fair to become a valuable auxiliary to the Society.

The Hon. Secretary showed a compact little hand-camera called "Itakit," made by Messrs. Matthews, of Biruingham. It was made to take twenty-four plates, lantern size.

Mr. Grant showed some work on Fry's naturalistic paper.

Mr. J. A. Sinclair theu gave a paper aud demonstration on "Lantern Slide Making." After meutioniug the different methods of slide making, Mr. Sinclair proceeded to expose some Ilford alpha and ordinary lantern plates with success, the burners used being the ordinary seven burners of the hall, and, consequeutly, difficult to judge by. Mr. Sinclair afterwards toned the alpha plate, which was shown at different stages of touing (wet) through the lantern.

After the demonstration slides were put through, the work of Messrs. Grant, Funston, W. Feuton Jones, A. Barker, Carpenter, Salmon, Heap, Rader, Gerard Smith, Herbert Smith, W. Smith, E. H. Jones, Hasdell, Hull, Beckett, and others. Messrs. Mawson & Swan also sent their prize set.

---

### Putney Amateur Photographic Society.

*April 25th.*—Mr. J. C. Leman in the chair.

The proceedings embraced a lecture and demonstration on alpha paper; the exhibitiou, by Mr. Faulkner, of a home-made apparatus for printing paper and plates; aud the development of platinotype prints, hot-bath process, with description, by Messrs. Martin.

The Society will make an excursion to Esher and district on May 9th.

---

### Glasgow and West of Scotland Amateur Photographic Association.

The closing monthly meeting for the session was held iu the rooms, 180, West Regent Street, on the eveniug of 20th April, Mr. John Morison, jun., president, in the chair; when five uew members were elected.

The President gave a report ou the International Photographic Exhibition to be held in the Fine Art Institute in September.

Mr. John Stuart showed his system of taking photographs by means of the flash-light. He also exhibited work done by this means. Mr. Stuart then photographed five of the members of council in a group, and the negative was developed and shown to the meeting, which closed with the usual display of lantern slides by the members.

An excursion took place on the 13th April to Dunure and Maybole. Some excellent negatives were secured, and a uumber of lantern slides from the same were shown at the monthly meeting.

---

### Newcastle-on-Tyne and Northern Counties Photographic Association.

The ordinary monthly meeting was held in the Mosley Street Café, Newcastle, on April 21st, Mr. J. P. Gibson in the chair. Arrangeuients were made for a series of competitions confined to amateur members of the Association (particulars of which will be announced shortly), and for five out-door meetings during the season.

Mr. J. Hedley Robinson read a paper on "Carbon Printing," and practically demoustrated the process.

Mr. Gibson, in proposing a vote of thanks to the demonstrator, rather fell foul of what he called the leatheriness and dulness in the shadows, which, he said, were characteristics of the process.

Mr. Robinson, in his reply, vigorously defended carbon, and made out a strong case for his favourite process.

The meeting concluded with a show of members' slides.

---

### Birmingham Photographic Society.

At a meeting held at the Midland Institute on April 23rd, the Chairman, Mr. G. T. Lyndon, congratulated the Society on again winning the National Silver Challenge Cup, and then called upon Mr. Jerome W. Harrison, F.G.S., for his paper aud demoustration ou "Instantaneous Photography."

Mr. Harrison announced that Dr. Norris's new dry collodion plate would be on the market about midsummer. A new factory was being built for its manufacture at Stechford. He explained the working of Decoudin's exposure meter, and Messrs. Hurter and Driffield's—which he had used for the past twelve months with success. Watkins's exposure meter was also shown. Warnerke's sensitometer was exhibited and explained, with examples which had been tested. In working, he preferred to employ Place and Underwood's shutters, instead of using a cap for lens. He advised members to use boiled distilled water when making up their developing solutions, and not to hurry development. If a plate is believed to be over-exposed, it is well to first soak it in a weak solution of bromide of potassium. If under-exposed, it is well to first soak it in a very weak bath of ammonia. Latitude of plates, he said, was often over-rated, and there is generally greater latitude for over-exposure than under.

After some other interesting and instructive remarks, the lecturer developed half-a-dozen plates he had exposed in a hand-camera in the streets of Birmingham that day, the whole of them coming up well. The developers used were Thomas's hydroquinine, pyro, and ferrous oxalate, as put up in their travelling cases. He then took several flash-light pictures of the company present.

---

Sheffield Camera Club.

A lecture was given on April 22nd (Mr G. T. W. Newsholme in the chair), at the Cambridge Hall, Cambridge Street, by Mr. W. Lamond Howie, F.C.S., his subject being "To Ober-Ammergau and back in 1890."

The lecture was illustrated by 120 photographic lantern slides, which Mr. Howie was enabled to take on his way to and from Ober-Ammergau, and also during his stay at that place, including some scenes from the Passion Play. He visited Bonn, Nuremberg, Cologne, Strasbourg, Munich, Innsbruck, the Bavarian Alps, the Tyrol, and many other cities and districts, and from each he showed excellent photographs illustrating the different styles of architecture to be found in the cathedrals and other magnificent buildings. The interior and exterior, and also the notable details of each building were given, besides views of the streets, museums, bridges, art treasures, and other objects of beauty and interest. Special reference was made to Cologne Cathedral. Nor were the country districts through which Mr. Howie passed neglected, as was shown by his remarkably good rural *genre* subjects, including life in the Tyrol. A number of the photographs of the Bavarian Alps were also examined with much interest, and, in alluding to his views of the Passion Play, the lecturer assured the audience that there was no foundation for the rumour that the play would not be repeated in the year 1900. Views of geological interest were also shown, including the curious earth pyramids in the Austrian Tyrol.

---

Received.—"A Survey of Pigeon Houses," by Alfred Watkins (W. Pollard and Co. Exeter). This is a very interesting illustrated pamphlet, reprinted from the *Archæological Journal*. It deals with those substantial, tower-like buildings which were used up to the last century for breeding pigeons, and which often afforded accommodation for five hundred couples. In those days, when fresh meat was often very scarce, pigeons were of great importance as an article of food. Some of these curious buildings are most picturesque, as the reader of this pamphlet may see for himself by studying the excellent photographs taken by the author to illustrate his remarks. Eight of them have been reproduced by collotype in a very perfect manner. We have thoroughly enjoyed a perusal of this pamphlet, affording as it does a peep into the lives of our forefathers from a new standpoint.——From the publishing firm of Knapp, Halle, the second part of Dr. J. M. Eder's "Ausfuhrliches Handbuch der Photographie," the first part of which was noticed in these pages in October of last year. The part to hand contains about 300 pages, with 127 illustrations. The progress of this so-called hand-book seems to justify the prediction that on its completion it will be the most perfect photographic encyclopædia ever published.——From M. Paul Nadar, No 1 of *Paris Photographe*, a monthly illustrated review of photography, and its applications to art, science, and industry. This first number contains forty-eight pages, and includes among its illustrations a portrait of Daguerre, and a series of photographs of Sarah Bernhardt in the rôle of Joan of Arc. There is also an autographic letter of Daguerre, and an autographic reproduction of the treaty made between Niepce and Daguerre in 1829.

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

Photargus.—*Stripping Films.* Try dilute hydrochloric acid alone, or a mixture of this with the potassium fluoride which you have already in stock. The Eastman gelatine skins should be kept in a dry place, or in a tin box, to prevent them from adhering or becoming mouldy. Get some more, for there is no better method of transfer.

Alpha.—*Collodion Process.* It is just possible that the cyanide fumes from your electro-plating operations may have affected the silver bath. This will be seen by the formation of a white precipitate of silver cyanide; so, if clear, this could not be the cause of your troubles. A transparent and streaky film would seem to indicate that the nitrate bath was too weak; but, instead of boiling it down, it is surely easier to strengthen it by adding fresh silver to the bath.

J. McG. (Belfast).—*Ferrotype.* You will find a very good description of this process in the Year-Book for 1889, pp. 166 and 167. Also in Mr. J. Fallowfield's catalogue, or *Photographic Annual* (London: 146, Charing Cross Road, W.C.), with, of course, in the latter case, a priced list of materials.

M. P.—*Photography in Natural Colours.* Your main question is answered by Dr. G. Lindsay Johnson's letter in the current number of the *Photographic Society's Journal.* We *had* examined the little spectrum by waning daylight before venturing to speak of it at the meeting, but, perhaps, the truest remark about the case was that "we hoped some day to see a finer specimen." Mr. Warnerke's results were inspected earlier in the afternoon, and they are certainly remarkable.

Viator.—*Moisture in Show-Cases.* When the sun shines brightly on a cold day, moisture is almost sure to condense on the front glass. Cutting holes for ventilation at top and bottom might obviate this, but in damp weather these apertures would require to be closed.

F. A. B.—Letter received, with best thanks for promise of future help.

J. P. Jones.—*Grains and Grammes.* By a misprint (comma for a decimal point), the weight of a gramme was vastly exaggerated. It should have been 15·434 English grains are equal to one gramme.

"Bringing Home the May."—Yes, you are right; in this fitful season there will be none to bring—or, at least, none ready by May Day. We have yet to look for a change of wind and April showers.

Middlesex.—*The Affiliation Scheme.* Since writing to you the report has appeared on the last page of the *Photographic Journal.* See the invitation given to local societies, so now you have only to apply and appoint two delegates.

L. F.—*Judges at the Exhibition.* The forms have been sent to every member, and there are *seven* spaces for the nomination of Judges of Awards, 1891. The papers are to be returned by Monday next, 4th May. Artists are eligible.

A. T.—*The Sector and Grease-Spot Photometers.* Capt. Abney and Messrs. Hurter and Driffield have met and come to agreement, the terms of which will be published in the forthcoming *Journal of the Society of Chemical Industry.*

W. Herrmann & Co.—The agency formerly held by Mr. Bucknall was transferred in January last to Messrs. Schwarz & Co. By an oversight, this change did not appear in the advertisement.

---

## Subscriptions to the Photographic News.

Including Postage to any part of the United Kingdom:—
Yearly...10s. 10d. | Half-Yearly...5s. 5d. | Quarterly... 2s. 9d.
To the United States, the Continent, and the Colonies:—
Yearly ... 13s. | Half-Yearly ... 6s. 6d. | Quarterly ... 3s. 3d.
To India and China (Yearly) ... ... 15s. 2d.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1705.—*May* 8, 1891.

CONTENTS.



## THE WORK OF A PHOTOGRAPHIC INSTITUTE.

BY W. E. DEBENHAM.

The claim so vigorously put forward by Mr. H. P. Robinson* for picture-making, and what is called the artistic side of photography, to be the leading subjects for consideration and teaching in the proposed Institute of Photography, will doubtless carry great weight, on account of the recognised ability of the writer in the walk which he represents. It is, therefore, desirable to discuss the question of the usefulness, or otherwise, of acting, in the formation of any general photographic society or institute, on the lines which he proposes.

The question may be put thus: Which is the more desirable to encourage in the public interest: that research which gives us new processes, methods, and appliances, and makes improvements in old ones, together with imparting technical scientific instruction in the various details of photographic work; or the endeavour to produce by photography, as it exists, of work of a more artistic character?

Taking the latter part of the question first in order, it may be noted, to begin with, that it is a phase in which the practicability of teaching is soon found to be exceedingly limited. Mr. Robinson himself puts it that, after a course of instruction to his own mind, "the decimal percentage of students who become artists must be left to evolve themselves." Will they not also, for the most part, after instruction and practice in photographic manipulations, evolve themselves, aided by their own innate artistic perceptions of the beautiful, and by the study of nature, and of photographs and paintings, to be seen in exhibitions and otherwise? Will they not only in this way learn what to imitate and cultivate, but what to avoid? One of our latest writers on art in connection with photography, Mr. P. H. Newman,† says that "art is the next oldest thing, perhaps, to the hills, and its canons are the outcome of the very nature of things, and as irrevocable. Nothing is more talked about to-day, and of nothing is there less to say. It cannot be taught; it may be learnt. It is much more likely to be felt after long, patient years of study; felt imperceptibly at first, than in a flash, and in full revelation." Doubtless the general recognition of the fact which Mr. Newman puts so strongly, that in the artistic development of photography there is more to be done in the way of self-cultivation than can be accomplished by instruction, and that what instruction is available in this way is soon exhausted, is the reason why so few papers and discussions on the subject have occupied—not in the Photographic Society of Great Britain alone, but photographic societies generally—so little time and attention. The exhibitions are natural instructors in this department, and there the student desirous to cultivate his artistic powers does so by considering the effect of certain productions, and the means employed to obtain them. In this respect artistic excellence stands on quite different ground from what is called technical excellence. The former is evident to the observer who feels it, and the means of obtaining it, by contrasted light, introduction of figures, or otherwise, is not concealed, but stands open to observation. No amount of observation, on the other hand, will tell the inquiring student what is the process that has been employed to obtain the photographic excellence of the work before him. This he must learn separately either by instruction, personal study and practice, or both together.

It seems to me to be a curious illustration of the one-sidedness that devotion to a particular branch of a subject may induce, that Mr. Robinson should take such strong views against possible modifications of the developer. He says that a student in the art department of an institute to his liking, found wasting his time over a new developer, or a modification of an old one, should be "dismissed without benefit of clergy." He further says that although he would even endow research, he would "bar any more modifications of developers."

Now, Mr. Robinson may have satisfied himself by experiments—which would have to come under the head of scientific work—that Messrs. Hurter and

* Photographic News, 1891, page 257.

† "Pictorial Composition," Photographic News, page 252.

Driffield's proposition to the effect that gradation is fixed by the exposure, and is incapable of variation by the developer, is true. He may have satisfied himself that this proposition is true not only of existing, but of all possible future developers. If, however, this is not certain—and it is not by any means admitted beyond controversy—it may possibly be just in the direction of development that the removal of the greatest defect in photographic processes may be looked for. The want of range of tone or gradation in the extreme lights and shadows of the subject has long been recognised by scientific photographers as the most serious defect in photographic representation. Owing to this defect, a high light standing visibly upon a light of somewhat less intensity, will, in a negative sufficiently exposed for the darker parts of the picture, come out no stronger—or not to the extent that is visible, stronger—than the light half-tone on which it stands. Capt. Abney put the matter very forcibly some years since that, owing to this defect in existing photographic processes, any subject reproduced a sufficient number of times would eventually lose all half-tones, and be rendered simply by those of two extremes.

Writers on the artistic side of photography, though not exactly of Mr. Robinson's persuasion, have more recently rediscovered this weakness—I think one of them has re-christened gradation as "values"—and urged the desirability of obtaining the gradations of nature on the plate, though without, I believe, giving any clue to fresh methods of securing it. If the registration of gradation of tone truer than at present obtainable should be discovered, it will be due to scientific work, of which the "artistic" professors will, doubtless, be ready to avail themselves. If it should turn out that such an improvement lies in the direction of the developer, Mr. Robinson will surely not allow his present strong view against any modification of that agent to stand in the way of the improvement of his work.

Those who artistically employ photographic methods owe their ability to do so to the scientific experimentalists who have evolved them, and, for further improvements, they must look to the like source. If they undertake the work themselves they become scientific experimentalists. The obligations of science to art in photography are not so clear. The teaching power of science and the improvements possible to continued research and experiment are unlimited; whilst instruction in the artistic department is by no means of the like inexhaustible character, and is such as can, for the most part, be acquired by observation on the part of those naturally gifted with the artistic faculty. In a complete photographic institute, however, there might eventually, as in that at Vienna, be classes for drawing and other subjects connected with artistic development, whilst its characteristic would be instruction and research in photography and reproduction methods.

Most photographic societies have shown themselves quite ready to give attentive consideration to papers on the artistic side. That these have been so few is not due to any discouragement from either the members or the governing bodies, but may rather be referred to the reasons already given.

If Mr. Robinson, and any who may think with him, believe that the most useful photographic society would be one at which art phases were made paramount, and scientific research and experimental investigation kept in the background, "occasionally welcome on technical evenings"; and if none of the many existing societies fulfils these conditions, let them add one more to the list. If such a society is really the model of usefulness, there must be room for it. Let the papers and discussions be made as public as are those of existing societies, so that a judgment may be formed of its comparative utility. This is surely a more reasonable proposition than an endeavour to capture the unformed Institute as a subject for such an experiment.

## THE ANALYSIS OF MOVEMENT BY PHOTOGRAPHY.

Professor E. J. Marey, whose treatise on terrestrial and aerial locomotion is so well known to English readers in the volume entitled "Animal Mechanism," has contributed to the new monthly periodical—which we briefly reviewed in our last number—*Paris Photographe*, an article upon the above subject, in which he describes recent advances in this particular application of photography. In this article he points out that ever since Muybridge, of California, succeeded in photographing twenty-four movements of a horse in the act of galloping—a photograph which, by the way, has now become historical—a precise means has been thus indicated of recording the movements of both men and animals. Muybridge, the pioneer worker, showed in his large work, since published, how many applications this method had to horses and other large quadrupeds, and also proved how the same system could be applied to the principal movements of man. He also showed how the photographs thus obtained, placed in a zœtrope, could be subjected to a synthetical process, and thus could give to the eye all the effect of the original movements. The possibility of applying photography to physiological studies of this nature was thus fully demonstrated. But perfection is seldom attained at the outset, and Mr. Muybridge's method was found to be beset with notable faults, and accompanied by certain difficulties. The introduction of gelatine plates made it possible to obtain with very short exposures well modelled images, in place of the mere silhouettes alone possible when these quick exposures were made in conjunction with the wet collodion process. The intervals of time separating the successive images were rendered more equal, an indispensable condition in determining the phases of movement. Finally, the zœtrope apparatus, destined to reproduce the photographed movements, was so imperfect that it somewhat deformed the images when projected on a screen, but it has now been perfected by M. Anschutz, of Lissa. There still remains in Muybridge's method a fault which greatly reduces its value in scientific applications. This fault is brought about by the employment of a separate lens for each image transferred to the plate. This big battery of photographic apparatus levelled against the animal in movement may be compared to a series of separate observers placed in one line, and who would each see the animal in a slightly different aspect. It is true that the changes in the perspective thus brought about are insignificant if the apparatus be small, and if the object is large and placed at a considerable distance from the lenses. If, for example, twenty-four cameras occupy a line only two metres long, and these are pointed at a horse moving at a distance of 50 metres, the error is unimportant; but if a smaller animal—a bird, for instauce—be placed near the lenses, the difference in perspective would render the analysis of movement quite impossible.

It was thus indicated that iu order to render photography applicable to these physiological studies, it is necessary to employ a single lens, so that the object in movement may be observed from the same point of view. M. Marey explains that he has been working for several years in perfecting apparatus which would work in this way, and he has described, under the name of photo-chronography, various means of obtaining, with very short exposures and with small intervals of time between each, successive images corresponding to the different phases of the movement.

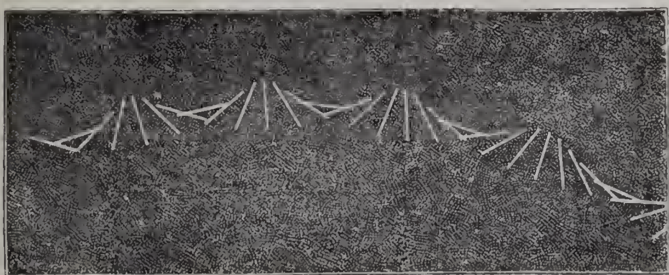


*Fig.* 1.

In certain cases it becomes necessary, in recording these movements, to point the lens to an animal of white colour iu bright sunshine, and with a black backgrouud behind it. A series of exposures are then produced at short intervals of time, which form on the sensitive plate images more or less separated from one another according to the speed of the moving object. In other cases the images are photographed on a long travelling band of sensitive pellicle, such as the Eastman film, but which by mechanism is brought to a standstill at the actual moment when the image is impressed upon it. The realisation of this rapid and jerky movement presented much difficulty, but the results obtained are of great importance; in fact, photo-chronography by means of a travelling film may be applied with few restrictions to all kinds of moving objects. It is no longer necessary to operate upou white objects or those of a light colour, or to place them in actual sunshine; nor is it necessary to use a black background in order that the object photographed may stand out clearly from its surroundings. One may therefore, by means of this more modern method, seek in all places for subjects for study without the restrictions which were once necessary. M. Marey states that certain experiments which are now in progress permit him to affirm that it is possible by this method to deal with objects of a microscopic character. The mechanism attached to the apparatus renders it possible to vary the length of the exposures and their periodicity, according to the nature of the movement studied. Slow movements necessitate comparatively long exposures; but in the case of quick movements, on the contrary, the exposures must be from forty to fifty a second, and their duration of course as short as mechanical means will permit. These rapidly-recurring and short exposures are necessary in the case of a bird or insect on the wing. These conditions once obtained, the apparatus lends itself to the most varied applications, as may be judged by certain examples which are given.

As already iudicated, photo-chronography on a fixed plate requires that the objects shall be light, well illuminated, and depicted on a dark field. Thus fig. 1 allows us to follow the double movement of rotation, and of translatiou of position in a white stick thrown across a dark backgronnd. Fig. 2 is obtained under similar conditions, but as the images of a jumping man present a greater surface, they have a tendency to overlap one another, and to get somewhat confused iu that way. This effect is produced when the speed of the moving object is insufficient, as may be noticed in this figure, at the moment when the jump is concluded, and the movement tends to the vertical instead of the horizontal. This confusion naturally gets more accentuated as the number of images is increased, or iu the case of the object depicted being of great length, such as a horse. In this case it is necessary to give movement to the sensitive surface itself. This is well shown in another figure—which it is not necessary here to reproduce—representing successive movements of a trotting horse, *a la* Muybridge.

*Fig.* 2.

By this latter method one is by no means limited to a dark background; one can, in fact, study the movements of an animal in its natural habitat, either in menageries or in the Zoological Gardens. Runners, gymnasts, &c., also come under the same category. In illustration of what is meant, a picture is shown of twenty successive images, obtained in two seconds of time, of men iu the act of fencing. Such movements, when photographed, permit useful comparisons between the right and wrong methods of doing certain work, and of different bodily exercises. Accideut has lately enabled M. Marey to make a comparison, by means of such photographs, between two fencing schools, which present great differences of motion: the one, the French modern school; and the other the old Spanish school, of which latter certain Neapolitan professors hold the tradition. Anyone can see at a glance the difference of the attitudes assumed by these two typical schools, and an adept at fencing who studied these photographs of successive movements would have the necessary elements for judging of their correctness and rapidity.

It will thus be seen that this improvement on Muybridge's system not only corrects the perspective as already indicated, but the circumstance that the images on a long band of film can be developed at the same time, and in the same dish, must confer greater uniformity on the pictures which result. M. Marey hopes before long to complete his experiments with the microscope, in conjunction with this new method of recording movements, and he believes that every type of life may be subjected to this treatment. He has already succeeded in photographing microscopic creatures with their images enlarged up to one thousand diameters, and has obtained such images at the rate of forty to sixty a second. One example given is that of a fly which is running along, and which at the same time is aiding its progress by movement of its wings.

## PHOTOGRAPHS IN COLOURS.

We have recently had an opportunity of carefully examining the pictures which are being produced by the Art Colour Photograph Company, and which consist of portraits and copies of pictures—notably a very effective reproduction of one of Meissonier's paintings. Almost ever since the first Daguerreotype picture was evolved, inventors have dreamt of producing, by the agency of light, pictures which should glow with all the colours of the natural objects which they depict, and, as all old photographers know, there have not been wanting pseudo discoverers who have asserted that the problem has, under their efforts, been at last achieved. Indeed, such reports have come up almost with the regularity of the appearance of the sea-serpent and the abnormal gooseberry. When, therefore, a new method by which coloured photographs can be obtained is advertised as having been discovered, the experienced photographer is apt to smile and pass it by as a tale which is told, and one that has been told but too frequently.

But the Art Colour Photograph Company differ from those who have preceded them in the same field by avowing frankly that the process by which their coloured pictures are produced is simply mechanical in its nature. They are obliged to withhold details of its working at present, in order that patents may be secured before the secret is out, and there the mystery ends. A process by which photographs are produced by employing different negatives for what are commonly called the three primary colours is familiar to most of our readers, for it crops up as regularly as clockwork, the initial impetus having been given to it by the late Mr. Woodbury about fifteen years ago. We are assured that the new process has nothing whatever in common with that well-worn idea; a single negative only is required. The cost of production will, it is believed, not exceed that of a plain photograph, and if this is the case the profession will doubtless find a large increase in their business by adopting it. Upon what terms this can be done we are ignorant, but information can be obtained from the Secretary at 155, Fenchurch Street, London, E.C.

London and Provincial Photographic Association. — May 14th, last lantern night of the season; May 21st, ordinary meeting; May 28th, "Theory of Ordinary and Polarised Light," Mr. A. Haddon.

The Lantern Society.—On Monday, April 27th, Mr. E. W. Bulkeley gave a lecture on the West Indies, illustrated by Mr. F. York's fine set of lantern slides. This was the last meeting of the present session; the meetings of the Society will be resumed in October next.

## CARBON PRINTING.*

BY J. HEDLEY ROBINSON.

Of all the processes, that of carbon or pigment printing seems to be the least known to members of our Association. This is to be regretted, as it is a method simple and beautiful in its working, and beautiful in its artistic results—in fact, it is the only process which embodies in itself the necessary elasticity to suit the artistic requirements of photographers, as the colour and surface of the finished print can be varied according as the class of work requires, whilst the absolute permanence of the results is undoubted. It is now more than a quarter of a century since the first photographs in carbon were produced by Mr. Joseph Wilson Swan, or by his process, and these are still to the fore, untouched by the action of light, or chemical or other actions which have been the cause of the fading away of so many once beautiful silver prints. The basis of the process is the action of light on bichromatised gelatine, which it renders insoluble, and not only it, but any colouring matter it may contain.

Carbon, or autotype tissue, as it is called, is prepared by coating paper with an emulsion of gelatine and permanent pigment of the colour required. After drying, it is made sensitive by immersing it in a five per cent. solution of bichromate of potash, and when again dry is ready for placing under the negatives. But a much simpler plan is to purchase it sensitive, ready for the printing frames. In process of manufacture, the Autotype Company render it sensitive to light by the incorporation of the bichromate, with the result that the least interesting and only troublesome part of the proceedings is avoided, and users have the assurance that the tissue is in its best working condition, which it will retain for a fortnight from the date of manufacture stamped on each packet.

Before printing, the negatives must have an edging of black varnish, an eighth of an inch wide, all round on the glass side to form a safe edge, the function of which is to keep the margin of the tissue quite soluble, to prevent the edges of the picture from washing up in development.

As the progress of printing cannot be seen, we must regulate that time by an actinometer, which is a box with a glass lid, on which are several tints of graduated densities; a slip of sensitive silver paper is pulled under these, and the box and the printing frames are exposed to light. An average negative will take about two tints of Burton's actinometer, which is the one we have got here, and which, you will see, has six small negatives. When the second lightest of these is printed to the ordinary depth, the tissue will be sufficiently impressed.

I have here pieces which have been so printed, and we will now proceed to develop them. Here I must mention that there is no gold bath or hypo bath used in the process, only clean water. First, pieces of the temporary support, which is wax prepared paper, are soaked till limp in cold water, then the tissue is also put into cold water, and when it has nearly flattened out again, after first curling inwards, it is put on to the support, both being under water, and then both are lifted out together by the finger and thumb of the left hand. Now we place them upon this mounting block and scrape out the water from between the surfaces. You see they now adhere together, and thus we will leave them for a few minutes. The action commenced by the light is continued in the dark, so that the development

* A communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.

ought to be affected as soon as possible after printing, say from one to three hours, or an allowance has to be made. Advantage can be taken of this continuation of action when the prints are known to have had too short an exposure; these, if left overnight, will be found to develop the same as if they had had the correct exposure.

Now let us develop our prints, which we left upon the temporary support; we place them in warm water at 105 degrees, and in a few seconds, when the coloured gelatine begins to ooze out at the edges, as you see, we skin off the paper on which was spread the compound in the first instance, and leave the greater portion on the temporary support. In this is embedded our picture, and by dashing the warm water over it, allowing it to soak a little, and again dashing it, the picture reveals itself. It is properly developed when dark-coloured streaks cease to run from the print. If it has been over-exposed, as this one was done purposely, we have only to increase the temperature of the water, say, up to 115 degrees or more, and we can perfectly reduce it, as you perceive. If under-exposed, we finish the development in cooler water and save the picture. Thus, you see, there is a very great latitude in this carbon process. When finished to our satisfaction, we give it a rinse in cold water and transfer it to a five per cent. solution of alum, which, after ten minutes' action, will free it from all traces of the chromic salt, and will render the gelatine quite insoluble.

Some of you might ask why the picture could not be developed on the paper of the tissue itself. This was a great stumbling-block to the early experimenters, who tried it and failed; because, as was argued, the light acts from the surface backwards towards the paper, leaving a delicate, insoluble skin on the surface of the tissue (which, although not interfering at all with the brilliancy of the finished print, seems to hold the gelatine together during development, preventing it breaking up), and varying degrees of solubility in its thickness according to the different densities of the negative, whilst that portion of the tissue next the paper is left almost wholly soluble, and that, therefore, if the picture is to be developed, that can only be done by dissolving away those portions of the tissue not acted on, or only partially acted on, by the light, and this can only be done from the back. Now, I particularly wish you to notice the evolution of the simplicity of the process as now worked. After the above theory was propounded, the first step was to coat a sheet of glass with bichromatised gelatine compound; this, after exposure, was coated with collodion, and then put into warm water, which attacked the soluble gelatine next the glass, and the picture floated off in a film held together by the skin of collodion. This was caught on a piece of paper, and the development of the picture finished. This was a somewhat difficult process, and I do not think ever got beyond the experimental stage. The next link in the chain was when, about 1862, Mr. Swan took out patents for improvements. Eventually he spread the gelatine compound simply on paper (like what we see here), and, after exposure, coated the surface with india-rubber solution, and mounted it on a piece of paper coated in a similar manner by passing it through the rollers of a copper-plate press. This enabled the paper of the tissue to be skinned off (as we have done to-night), and, after development, left the picture on the india-rubber paper; it was, of course, a reversed one, and to overcome this he made a transfer paper with plain gelatine treated with alum; this, after softening in warm water, was laid upon the picture, and when dry the india-rubber temporary support was peeled off, after moistening with benzine, thus giving the picture in its proper position. This was a perfect process, and by it some of the finest photographs have been produced. But with its heavy copper-plate press, its messy india-rubber solution, and the use of the pungent benzine, it was hardly suited for general photographers. So when, about 1868, Mr. Johnson, one of the founders of the subsequent Autotype Company, simplified it yet more, a great boon was conferred upon the photographic world. He found that no cement at all was required to fix the exposed print on to any support, but that it was enough to lay down the wetted tissue on an air-proof and water-proof surface, remove the air and water from between the two surfaces by the use of the squeegee, as we did, and it would adhere by atmospheric pressure, caused by the vacuum created, in the same way as a boy's sucker or "clagger" sticks to the stone he wishes to lift.

Now we will take our prints from the alum solution. We notice they are reversed. But as the support has been waxed with a solution of resin and beeswax in turpentine, which allows the picture to be eventually stripped, we will take a piece of this final transfer paper, which has been soaking in a two per cent. solution of alum for about an hour, place it and the print in water, bring them out together, place them on the mounting board, squeegee them, and hang them up to dry. When thoroughly dry they can be easily stripped off, leaving the support ready again for use after waxing. The support may be opal glass, when the print will take its matt surface.

This is the double transfer process necessary for ordinary negatives. A simpler one is the single transfer, but this requires reversed negatives or film ones printed from the reverse side. In this case the support is prepared paper without the waxing, and the print is finished as soon as developed, alumed, and rinsed.

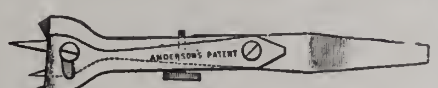
It will be seen that the finished prints are composed of insoluble gelatine, of the nature of vellum, in which is embedded a permanent pigment, and is of all the processes, platinotype perhaps excepted, the only one that can be absolutely relied upon for permanence.

In conclusion, I may say that all patents for this process are run out, so that any who wish may use it without let or hindrance. All materials can be obtained from the Autotype Company, New Oxford Street, London.

---

Messrs. Lancaster and Son, of Birmingham, have sent us a copy of their new catalogue, which contains prices and descriptions of every photographic appliance. As a publication the book is ornate, very well printed, while the numerous woodcuts are of such excellence that they leave an impression on the mind that Messrs. Lancaster must be very particular as to the way in which work should be turned out.

Expanding Centre-Bit.—Mr. R. I. Anderson, of 3, Poulton Road, has invented a form of centre-bit which should be of great use to those who, like photographers, have often to do a little bit of home cabinet-work. As will be seen from the annexed illustration, this ingenious little tool is so arranged that




the vertical cutting edge can be fixed at different distances from the central point, at once giving the power of drilling holes of any size—within certain limits—with a single bit. A tool of larger size, which would cut holes of varying diameter for the accommodation of a lens flange, would be a great boon to all photographers.

## TECHNICAL SCHOOLS FOR PHOTOGRAPHY.*

BY MAX JAFFE.

The objection will now be raised that technical schools, which have been organised on the basis of production, will injure the photographic profession by attracting part of their profits. This may be unhesitatingly denied. One must consider that in all cases in which something is to be done for the public good, the nature of the benefit demands that, from one quarter or another, sacrifices must be made. Moreover, the sacrifice which will be imposed on the photographic profession is insignificant when expressed in figures, because photographic technical schools, for many reasons, can only be found in big towns; consequently, the loss of profit will distribute itself over many institutions, and will be scarcely perceived by individuals. On the other hand, the advantages which good schools will afford our profession will soon become apparent.

From the above discussion, the conclusion is to be drawn that thoroughly instructed, capable scholars can very seldom be produced by photographic technical schools with academical methods, even when they are really well conducted, and provided with the best instructors. Scholars issuing from them will not be clear on the subject of how much knowledge and power they possess; some will even cherish the delusion that they have acquired all that is worth knowing, and will start off to make—with what they know—an independent living. It is quite another thing with regard to the schools where the students are taught practical work. The scholar who has just left one will be perfectly aware that he has acquired a certain amount of capability, and already knows a little; but that this little is unimportant beside that which he must know and be able to do in order to organise and manage a studio. Therefore, he will be much more inclined to endeavour to gather for himself fresh experiences through service in a business studio; consequently, technical workmanship, which has had a suitable pre-education, will be conveyed to the existing studios, and that there is a great need of this is well known to all professional people.

In time it will, perhaps, come to pass that the visiting of photographic technical schools will be more and more regarded as a necessity by those whose education has been provided in entirely empirical ways, and who find they have to withdraw in favour of those who have received artistic, scientific, and practical instruction.

We will not discuss the handling of individual instruction. Only the fact is to be pointed out that scholars, in exactly the same way as assistants in a business studio, have to do certain work, proposed to the school, under the responsible guidance of technical men, who preside over the educational course as teachers. Better and more effectually a scholar can prove his right to practise, and his proficiency, by reference to serviceable work performed by himself, than by splendid certificates and exhibitions.

How much time the scholar shall devote to the educational course depends principally upon which and how many branches he wishes to undertake. Two years ought to be considered the least period to be given by those young people who are inscribed as regular scholars. The educational course should be accessible to strangers, to the possessors of studios, and also to their assistants, and opportunity should be offered to continue their education in this or that branch.

* Continued from page 318.

Whether, and how far, photographic technical schools will be contemporaneously called upon to serve as experimental institutions we will not discuss here. We will state, however, that we should hold it advisable to admit scholars who have half completed their education, and who wish to try new methods. If this were not done, scholars would be easily misled to amateur practice, and there is the danger of their carrying this amateurism into their later business practice.

The teacher must, in every lesson he gives, be it in the form of an exposition, or in the conducting of practical demonstration, so throw himself into his work that the scholar will gain the impression that he possesses a wealth of knowledge.

The drawing studios, as well as the lecture rooms, and the laboratories in which the subordinate sciences are taught, must stand open to the scholar during the whole length of his school course. Although, in the educational course, the professional men are considered to occupy the principal place, the artists, as well as the scientific men who are engaged in the school, should be allowed free licence, in order to prove their powers of stimulating and instructing in every direction. Art, science, and professional practice must have representatives united in a harmonious co-operation, if photographic technical schools are to prosper.

In the foregoing we have striven, on the strength of our personal observations, to portray the manner in which photographic technical schools must be created, and to show how the desired ends can really be attained. We are well aware that we have but superficially touched, in a sketchy manner, on much that merited a closer consideration, as we were mindful of the narrow space which the form of a journal affords us. Nevertheless, we hope to have another opportunity to engage in a further discussion of such points at some future date.

If we contemplate the position of the photographic profession in these days from a commercial point of view, we find that its vocations are becoming more and more narrowed in many directions. This is in consequence of the fact that thousands photograph, not as professional business men, but for scientific and artistic purposes, and also for pleasure, and these, as far as their technical and material means allow them, meet their requirements by their own exertions. Considering the prominent position which, in the widest sense of the word, photography occupies in modern civilised life, it is a question of universal interest that they who manage a business of this kind shall be not pressed back, but that they shall be supported and helped forward. The better education of young people who devote themselves to photography can be regarded as an available means to the purpose, for proper technical schools would materially contribute to the elevation of our profession.

[We regret that, owing to a slight error, our esteemed correspondent, Herr Max Jaffe, was made to say (page 299, Photographic News): "Only a total reformation of our modern *methods of instruction* would be of the slightest use." The sentence should have been rendered, "Only a total reformation of our modern business methods would be of the slightest use."—Ed.]

Photographic Club.—Subject for May 13th, "New Hand-Cameras"; May 20th, "Hand-Camera Possibilities." Saturday outing, May 9th, Dagenham; train from Fenchurch Street at 2.32; meet at Dagenham Station 3.15.

## CRYSTAL PALACE EXHIBITION.

This Exhibition closed on Saturday last, and Mr. Wollaston, together with the general management, is well satisfied with the number of visitors, above the average at this season of the year, which it has attracted to the Palace. We have already stated that the apparatus department was not nearly so large as in former years, but, although this section of the Exhibition was smaller, it could not be looked upon as unimportant. Hitherto, pressure on our space has prevented us paying that attention which is its due, and we will now endeavour to briefly supply the omission.

The Platinotype Company exhibited many of their works, but, of course, the best testimony of the beauty of this process is in the large proportion of pictures produced by its aid which figured in the art section of the Exhibition. The public, however, seemed much interested in watching the demonstrations which took place throughout the day, when the dirty yellow image on the exposed paper was suddenly, and as if by magic, changed to permanent black by dipping into the hot bath. Messrs. Watson & Son, of High Holborn, had one of the most important exhibits in the Palace, and occupied much space. Their well-known "Acme" camera fitted with aluminium mounts attracted great attention, and many visitors were to be seen curiously balancing in one hand a lens with the old heavy brass mount, and in the other one of similar size mounted in the silvery and lighter material. Messrs. Noakes & Son, of Greenwich, also had a very interesting exhibit, in which lanterns and their belongings formed the principal items. A very noticeable feature of Messrs. Noakes' improved lantern is the manner in which the jet is fixed upon its support. This support, instead of being an unwieldy upright rod of iron fixed upon a metal tray, as in most lanterns, consists of a brass fitting attached to the back of the lantern body itself, and outside the instrument. It is so fitted with a nut and screw that the jet can not only be thrust to and fro, so as to be adjusted for different distances of screen, but it can, when centred, be rigidly fixed in its place. A further advantage possessed by this fitting is the very small opening at the back of the lantern through which light can come. Messrs. Noakes also exhibited a number of English condensers, both for lantern and enlarging apparatus. Close by, Messrs. Taylor, Taylor, and Hobson, of Leicester, showed a number of their lenses, including their well-known caskets. The "Hawk's-eye" hand-camera, recently described by us, was also on exhibition here, as well as the finders and levels which this firm have for long made a speciality.

Messrs. Matthews and Co., of Birmingham, showed two forms of cheap hand-cameras, one entitled the "Kinematic," and the other the "Itakit"; this latter is made entirely of metal, and has a magazine of twenty-four plates which, by a very simple arrangement, can be transferred one by one to the camera. Messrs. Parker and Co., of Holborn, showed their "Companion" hand-camera, fitted with a new form of shutter, which appears to work well. Mr. Slater, of Camberwell, showed a well-designed camera, which permits of the use of long-focus lenses, and which is produced at a very cheap rate.

Mr. England, of Notting Hill, exhibited a number of negatives produced by his films, notably one of a pen-line subject, in which the lines were absolutely clear on a dead-black ground, showing how suitable such films would be for process work, in which the wet plate is still almost universally employed. Arundel and Marshall's boxes for storing plates and negatives are well known, and we were reminded of their existence by seeing them here. Messrs. Houghton and Son, of High Holborn, showed a large portable dark room fitted with their well-known sink and every dark room contrivance that the most exacting photographer could desire; and they also exhibited their automatic hand-camera, which we described in these columns only a few weeks back. It is to be hoped that, when the time for the next Crystal Palace Exhibition comes round, the apparatus section will be augmented by several exhibitors who this year have only been conspicuous by their absence.

## THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Programme of Bath Meeting, 1891.

*July 6th.*—Reception and presidential address.

*July 7th.*—Excursion to Chepstow and Tintern.

*July 8th.*—General Meeting; Meeting of General Committee; Convention Group; Papers from 3 p.m. to 6 p.m., and 8 p.m. to 10 p.m.; "The Photographic Work of Herschel and Fox Talbot" (with illustrations), W. Lang, jun., F.C.S.; "Recent Developments in Printing Processes" (with illustrations), C. H. Bothamley, F.I.C.; "Recent Astronomical Photography," A. A. Common, F.R.S.

*July 9th* (day).—Excursion to Salisbury; ditto to Bristol and Clifton. (Evening)—Report of the Lens Standards Committee; discussion on proposed international standards, opened by L. Warnerke.

*July 10th.*—Excursion to Glastonbury and Wells; ditto to Corsham and Laycock Abbey; (evening)—Dinner and Smoking Concert (tickets 5s.).

*July 11th.*—Council Meeting.

Permission to photograph in the places over which they have control have been granted by Right Rev. and Noble the Lord Bishop of Bath and Wells, the Very Rev. the Dean of Wells, the Very Rev. the Dean of Salisbury, the Very Rev. the Dean of Bristol, the Rev. C. E. Cornish (St. Mary, Redcliffe), and C. H. Talbot, Esq.

The Bath Photographic Society have placed their meeting room and dark room at the service of the Convention.

The White Lion Hotel and the Royal Hotel will be the headquarters of the Convention during the meeting.

Hon. Sec. and Treasurer, J. J. Briginshaw, 128, Southwark Road, S.E.

Messrs. Eyre and Spottiswoode, the well-known printers, announce that they have acquired the business of the Woodbury Company, and that the business will be now carried on by them, but under the same management as heretofore. The change has been brought about by the retirement of the senior partner.

Edward William Parker, a photographer, whose address was given at Hampstead, surrendered to his bail to answer the charge of obtaining money from a large number of persons under the pretence of taking their photographs. Mr. Farman appeared for the prisoner, against whom evidence in eleven cases had been taken. Ellen Harding, the wife of a messenger in the Colonial Office, residing in Brackenbury Road, Hammersmith, said in October last she went to 370, Uxbridge Road, where she saw the prisoner, who took her child's photograph. He said the photograph was too dark, and asked her to call again. The photograph was taken three times, and she paid 6s. 6d. She sent for the photographs, but the prisoner said the weather was bad and he could not turn them out. He promised to send them, but she never received them. Ellen Kearley, of Glenthorne Road, said she paid 12s., but she never received any photographs. Witnesses were called, who proved that a large number of persons called to inquire for the prisoner after he left his addresses in Cambridge Terrace, Fulham, and at 370, Uxbridge Road. The prisoner, who pleaded "Not guilty," and reserved his defence, was committed for trial, bail being allowed.

## Notes.

"The Lodger's Friend" is the somewhat whimsical name for a new form of bottle-lock which has been designed and patented by Mr. T. E. Halford, of 61, Chancery Lane. It consists of a metal belt to embrace the neck of an ordinary wine bottle, with a hinged band attached, which is bent over the cork and fastened to the belt by a tiny padlock. The photographer does not deal with liquids of a kind which tempts the wanton palate, but he has in use certain fluids of a volatile nature which are apt, in hot weather, to force the unprotected stopper from the containing bottle, and we venture to suggest that an adaptation of the same principle—omitting the padlock—would be useful in the laboratory for bottles containing ammonia, ether, and similar compounds.

The *New York Sun* comments upon an interesting fact regarding photographic portraits which, in the course of business, fall into the hands of an engraver. At first glance such a portrait may be regarded as generally attractive, but, as the engraver devotes careful attention to it, day after day dissecting it, so to speak, as he expresses it in lines on his plate, a different feeling arises in his mind, and often he will detect under the exterior polish a bully and a sneak—a man who will do anything to gather in the shekels. On the other hand, he may be repelled at first by the homely, common-place appearance of a man who, on the same closer acquaintance, gradually improves. The hard look gives way under closer acquaintance, and the features grow friendly. So that engraving a man's picture is a good deal like knowing the man himself—intimacy brings out the truth about him.

A correspondent of the *Photographic Times* recently made a suggestion with regard to exhibition photographs which is worthy of consideration. He believes that many would-be exhibitors are prevented from sending in their works for the simple reason that they have little time or inclination to get them framed. He points out that if photographs intended for exhibition were sent in unmounted, they could then be handed over to a professional worker, who would be instructed to mount them all in the same simple manner. A picture would not then claim any adventitious merit from being more tastily mounted and framed than its fellows. He believes that if this course were followed, the number of contributions sent in for exhibition would be largely increased. It will perhaps be remembered, in connection with this matter, that a few months ago we described and advocated a method of exhibiting unframed pictures which has long ago been successfully adopted by the Fine Art Society at Bristol.

Mr. J. R. Gotz, of Buckingham Street, Strand, has shown us some very fine examples of photographic illustrations which have been produced by F. Thevoz and Co., of Geneva, and for which he is the accredited agent. They appear to owe their origin to some modification of the collotype process, but whatever be their nature, the effect given is of the best.

Messrs. Percy Lund and Co. have organised, under the management of Mr. W. E. Henry, C.E., "The Practical Photographers' Federation," the main object of which is an invasion of Canada, to take place next month. In other words, the federation will consist of forty practical photographers, who will each subscribe fifty pounds to a common fund, to enable them to do photographic work with large profits amid the farming and mining districts of Canada. One would have thought that if the said outlying districts had shown signs of hungering after photographers, the old-established Canadian towns and cities would have been able to meet the demand. But it seems that it is not so, and Messrs. Percy Lund and Co. have risen to the occasion. To that enterprising firm we must refer those who wish to learn more about the matter.

Librarians of the numerous free parochial libraries which are springing up all over London must see that photography is well represented, or somebody will want to know the reason why. A correspondent of a contemporary complains that he can get any number of textbooks on angling, golf, and lawn tennis subjects, in which he does not take the least interest, but that in all which concerns photography the library is very deficient. We suppose it depends whether the librarian is a photographer; if he is, there will be no lack of photographic literature.

The question has been asked, Why does not some ingenious and unscrupulous person take to forging postage stamps? It is pointed out that many stamps are neither more nor less than negatives as they stand, while, supposing that the imitation be not very good, no one ever dreams of examining a stamp to see whether it is genuine. A writer in the *Moniteur de la Photographie* lately said: "Without knowing anything, we are perfectly sure that a large system of fraud is being carried on, and by a very easy method." This is rather alarming, and we hope the ingenious forgers are confining their operations to France.

It has been suggested more than once that the reproductions from photographs of pretty women wearing the latest fashions would be a great improvement on the inane prettinesses which form the usual style of illustration in fashion books. This, of course, is an artist's opinion. The experienced costumier knows better. Said the proprietor of a leading fashion magazine the other day: "Yes, I tried photographs once, but never again. A photograph may do when you want to show a bonnet or a hat only; but for a costume, where the full-length figure is wanted, the dumpiness which the camera gives is fatal. Our fashion ladies must be 'divinely tall,' but in photographs they are always short and squat. After all, ladies don't buy fashion plates for the faces, and if the waists which our artists give the figures are impossible, everybody knows they are so. The whole thing is conventional." There is a little logic in what this gentleman says.

It may be a consolation to photographers who live in "cutting" neighbourhoods where competition has forced prices down to a point which yields little more than a bread-and-cheese existence, that artists are not much better off. The schools of art all over the kingdom have resulted in the over-production of tenth-rate artists, who, if they get any commissions at all, take them at an absurd figure. We know a case where a young artist undertakes to draw and colour from photographs military figures, cabinet size, at the rate of eighteen shillings a dozen. These water-colour sketches are sold retail at half a crown each, and, working his hardest, the artist cannot do more than half a dozen a day, so that he earns about the same wage as a decent carpenter.

## THE ROYAL ACADEMY EXHIBITION.

A PRIVATE view at the Royal Academy is hardly an occasion to choose for a careful examination of the works exhibited, for the world of fashion is there, and the attention of the reviewer is perforce distracted occasionally from the pictures to the visitors. Many of these fashionable personages apparently prefer to chatter about their own affairs in loud-voiced tones, rather than to trouble themselves with the claims of art, just as thoughtlessly as they will in their own drawing rooms sometimes, when another branch of art should—if only out of courtesy to the performers—engross their attention. But despite these drawbacks of visiting the annual exhibition at Burlington House on this semi-private occasion, it is possible to make a few notes respecting the general aspect of the show.

Let us say at once that the Academy exhibition of 1891 is, in point of excellence, above the average. It may, perhaps, be more noticeable to one who is in the habit of dealing with the tones of silver prints, and the still more sombre hues of those furnished by the platinotype process, that the pictures hung at Burlington House this year should seem to revel in a wealth of beautiful colouring. Many of the artists, indeed, who are not in the habit of stinting us in this respect of colour, are lavish this year; with the result that the walls of the galleries have a very gay appearance indeed. But it is not alone by rich colouring that the present exhibition will be distinguished; the variety of subject and treatment is astonishing; so that an examination of this year's exhibition is as valuable to the earnest student in something to think about, as it is to the butterfly of fashion in something to talk about.

There are several pictures that at once arrest attention, and we must give the premier place to that of Mr. Luke Fildes' "The Doctor." This is a large and most admirably composed picture, and its great merit is that its story is simple and well told—a pathetic story truly, and one that has been enacted, and must be again and again, in many a household so long as the troubles of this world shall last. In a squalid cabin, upon a bed extemporised upon two chairs, there lies a sick child in the bright light from a partially shaded lamp on the table. A grave, clever-looking doctor—the principal figure in the composition—sits near, earnestly regarding the critical case before him. In the subdued background are the parents, the woman with her head on her folded arms giving way to her grief, and the man looking dreamily towards the child as if he can hardly realise the terrible possibilities of what may happen. These are simple materials from which to form a picture, but it has been done by Mr. Luke Fildes with consummate skill. Those photographers who take pains to produce story pictures, too often with such lamentably wooden results, would do well to study this masterpiece. And with this thought, a suggestion occurs to us which might be valuable to the organisers of coming photographic exhibitions. Why not, instead of allowing competitors to choose their own subjects, take some good example, such as the painting now under discussion, and offer a prize to the photographer who succeeds in reproducing it most cleverly in monochrome, and with the help of living models? The difficulties of such a procedure would be, no doubt, enormous, but the triumph of overcoming them would be proportionately great.

Another picture of a somewhat similar subject is by Mr. Frank Dicksee, and it is called "A Crisis." In this case, a young woman lies supported by pillows, and apparently dying of consumption. Her father, husband, or brother—we know not which—sits by the bedside anxiously and intently watching the invalid. This picture is, as a work of art, inferior to "The Doctor," and although, in the story told, they have so much in common, there seems to be something painful here which does not obtrude itself in the other work. It is certainly not a picture which one would wish to be a permanent feature of a home, but it is fair to say that the figures are most life-like and beautifully painted.

The same may be said of another work by this artist, but not by reason of its subject, but rather because it is on a large scale, and is of that decorative treatment which would render it more suitable for the vestibule of a public institution than for the walls of a private room. In this case Mr. Dicksee has drawn his inspiration from a mythological source. "The Mountain of the Winds," the title of the picture, refers to a certain mountain in Arcadia, where, according to the Greek oracle, "the four winds prepare to take breath for their courses on the earth." Both the drawing and colouring of the figures which typify the winds are very fine.

But it is with the portraits that the earnest photographer will feel the greatest interest. He knows that, of late, photography has been somewhat severely criticised by certain gentlemen of the brush, and, while willing to take a lesson from the higher phase of art, he feels, at the same time, in a critical mood himself.

In viewing some of these portraits, we are certainly at one with the Chancellor of the Exchequer, who offered an apology to the artists assembled the other night at the Academy dinner, "in the name of a colourless, humdrum, prosaic generation, to the genius of art for the commonplace nature of the materials" with which they had to deal. Of course, he had the portraits in his mind, and especially the pictures of the various nobodies who annually make their appearance at Burlington House. Here, for instance, is a picture of a middle-aged gentleman, standing with one hand on his hip, while the other holds his hat. It is a life-sized full-length figure dressed in drab. Now, if it was really necessary to the peace of mind of this amiable being, or that of his family, that his portrait should not only be painted but also exhibited, would not his head, or, say, his head and shoulders, have been sufficient for the purpose? The rest is merely a tribute to his tailor, his hatter, and his bootmaker, and although the goods seem to be of the best quality, there is no need to advertise them at the Royal Academy. There are far too many portraits of this type at the present exhibition, and we fear there is no help for it so long as human nature is as it is; but it is often vexing to find that valuable space is taken up with the counterfeit presentment of personages who are not known beyond their own family circle, and about whom, outside that little ring, no one feels the slightest curiosity or interest. If a man be blessed with a handsome face, or one wherein the beauty of his mind, exalted intellect, or force of character can be plainly read, by all means let his portrait be exhibited, for it will be a delight: but where nature has only produced an impresssion in ordinary clay, it is ridiculous to give it such distinction. We must reserve a more detailed notice of the portraits—good, bad, and indifferent—for a future occasion.

(*To be continued.*)

## A SUGGESTION FOR A POSSIBLE METHOD OF IDENTIFYING THE COLOURS PHOTOGRAPHED.*

BY JULIUS F. SACHSE.

The production of orthochromatic or colour-stained plates, which will yield negatives or prints giving approximately true colour values, is at present one of the most active problems of the photographic world, attracting the attention of specialists and active researchers in almost every country. These colour-sensitive plates, by reason of improvements made in the dyes used, thus ensuring their stability or keeping qualities, in addition to increasing their sensitiveness to shades of colour, together with the reduction in the price of manufacture, have of late increased their popularity with the professional as well as the amateur photographer, so that where, but a short time ago, they were only used by experimentalists, and by a few professionals for copying art paintings and like subjects, they are now coming into general use in all branches of photography, from studio portraiture down to the snapshot of the hand camerist.

Ever since the orthochromatic principle was first broached, the hope was fostered that by some means, in addition to giving true colour values, it would become possible to find a method to distinguish or identify by the print the colours in the original. This problem has for a long time remained a matter of conjecture and research, engaging the attention of the best known photographic students and theorists at home and abroad, as is instanced by the experiments with the solar spectrum and shades of colour—thus far, however, without leading to any practical method—by which the colours in the original might be identified at sight.

In connection with this subject, I wish to bring to your notice a suggestion for a simple method by which this much-desired object may be obtained, at least under certain conditions in suitable subjects, as you will see by the results shown by the negatives and prints as well as on the screen. The experiment may be considered a partial solution of the problem, at least within the scope of the subjects and colours upon which I was able to experiment. The subjects were entomological and ornithological (butterflies and birds), and were selected with reference to the brilliancy of the colours, and the difficulties which they have heretofore presented to the photographer. The suggestion, as you will perceive, is simply to photograph a colour key along with the subject, which shall explain itself. Of course, I do not for a moment wish to claim that this method will work in every case and subject, or where there is a marked admixture of white or black with the respective colours; but under stated conditions, for such subjects as indicated, as well as other departments of natural history, where the colours of the insect, animal, or flower are bright and decided, I do claim that with suitable orthochromatised plates, and where the requisite care is taken to prepare the colour key, and to ensure correct exposure and development, the suggestion, simple as it is, will be found to work satisfactorily, and that the colours of the original can be distinguished or recognised in the print in every case by the student who is able to judge, regardless of how much it might puzzle the general observer who is not at all familiar with the subjects.

I will now call your attention to the negatives and prints, and will state that they were made on the ordinary commercial plate, with a portable outfit, in the Academy of Natural Sciences of Philadelphia, with a poor side light, under very adverse conditions. The first picture was a print of eight butterflies, selected on account of their varied colours, which comprised lemon-yellow, brilliant blue, blood-red, orange, bright red, and black. Care was taken that the specimens, with the colour key, should all be upon the same plane, and to ensure an equal illumination. The colour key was formed of a plain white card, upon which was fastened pieces of tissue paper, matching in colour the hues of the moths; two of the shades, the bright blue and the red orange, I unfortunately was not able to match exactly from the resources at my disposal as well as they might have been. However, crude as this experiment is, the result will prove the correctness of the principle as suggested. With the use of a colour screen or light-filterer much better results can be obtained, which I trust to show you at a future meeting. Still, you will perceive that the four colours can be easily identified in the subjects. The plates used were the regular Carbutt orthochromatic, Sens. 23. The development was with the combined developer as per formula in *American Journal of Photography* (February, 1891, p. 91). I will also state that plates of the same emulsion, but not orthochromatised, did not prove successful, as you will see by comparing the prints numbered I., VII., and VIII., respectively. The attempt to attain the results by pyro and soda developer also resulted unsatisfactorily, all things being equal.

In the next subject, the *Sittace macao*, or red and yellow maccaw—a very unpromising subject—you will see on the print from an orthochromatic plate the five colours, cream, blue, yellow, red, and green are all plainly marked or discernible, while on the print from a plain plate there is but little distinction between the two first colours or the three latter ones.

One matter I overlooked in this experiment, viz., in making a colour key always to include black where it appears in the subject, as where bright, deep red and black appear close together, as in this subject, it would be hard to tell which was the red from the black, especially if strongly printed.

The question may be asked, Of what practical value or extended use is this colour key? In reply I will state, first, from a scientific point of view, that any process of reproduction by which the natural colours can be deciphered, or even approximated, must prove of the greatest value. This is especially true in the department of entomology and ornithology. Further, the absolute truthfulness of the photographic processes is far in advance of the laborious and expensive hand productions which are now used in the study of scientific matters. In addition, our present illustrations too often carry with them the individuality or imagination of the artist, to the detriment of nature, notwithstanding the great care taken by scientists to obtain the pictures true to nature. Then we have the great search power of the camera, with, perhaps, its greatest possibilities yet undeveloped, showing the structure of insect life, with a fidelity to nature in its most minute parts unequalled by any other process, which is now supplemented by the simple process brought to your notice this evening, foreshadowing the possibility of distinguishing the various shades of colour in the original.

From the commercial point of view, the above application cannot be over-estimated, as you will see that, by the aid of the colour key and orthochromatised plate, a nega-

* Read at a meeting of the Photographic Society of Philadelphia.

tive can be obtained from which a half-tone (Ives) process block can be made, retaining the graduations of shade necessary to the identification of the shades of colour in the original, thus opening a field for the production and illustration of scientific works on a scale heretofore impossible, while, at the same time, reducing the price and increasing the value, which cannot but help to popularise the study of the scientific subjects to which the process is applicable.

## PASTEL PAINTING.

THE following directions, recently published in the *Artist*, will be of service to those who wish to try their skill in working-up photographic enlargements by means of pastels.

"The materials employed are soft crayons or chalks of various shades and colours, and some pumice paper stretched on frames, of which there are many sizes, artists preferring pumice paper, as being less liable to hurt the skin of the fingers in the blending together of the colours after they are laid on to the paper, for in pastel painting the work is entirely done, or ought to be done, with the fingers and the palm of the hand. The intended subject having been lightly sketched in with charcoal, proceed to lay on the colours, always commencing to work from the top, carefully blending them together with the fingers in order to put on the necessary tints. The crayons should not be cut or pointed excepting when some little finishing touches are desired to be given to the features and hair, but should be gently rubbed on the paper, one colour over another, and blended into form with the fingers; by which means a marvellous delicacy aud softness can be procured. The shading is done by what is termed cross-hatching. Some pastel painters employ a stump, either of paper or leather, but I have always found that results of a far more satisfactory nature are arrived at by working the entire picture with the fingers alone, and by a careful manipulation of the colours au effect is obtained almost equalling in strength and beauty that of oil colours, combined with that delicacy and transparency which is an essential quality in the highest portrait painting. For all large surfaces, such as backgrounds, &c., the palm of the hand should be used in manipulating the colours after laying them on the paper. It will be found that when working with the crayons they are apt to break of themselves, and the sharp edges thus acquired will be of appreciable benefit in helping the student to produce the form he seeks to achieve. It is important that great care should be exercised in laying on the colours so as to avoid too frequent coatiugs, which tend toward opaqueness. The chief aim to be sought in pastel painting should be trausparency, combined with freshness of colour. Different coloured papers are sold for working on with crayons, but that of a yellowish hue is considered the best for pastels. Should it be found necessary to efface any colour from the work, recourse should be had to a sable or hog-hair brush, with which the offending colour is easily dusted off. Should, however, any small particle still remain on the work, it must be gently blown away. Pastel paintings are usually covered with glass in order to protect them, aud I consider this to be advisable, although I believe there is a way now of so fixing the colours as not to make this obligatory. In conclusiou, I would recommend that, after the student has made himself acquainted with the preliminaries of the art, he should call in the aid of a master."

In connection with this matter, the following paragraph, clipped from an American technical journal, will be of interest.

"Lovers of pastel painting will be glad to hear that at last a way has been found to fix the colours without injuring them. A New York gentleman has invented a uew fluid for this purpose which does not injure the most delicate tiuts, and at the same time it fixes them securely to the paper or canvas so that they cannot be rubbed off. There have been preparations for fixing charcoal crayons, but none which would answer for coloured pastels, the many which have been brought out having either au injurious effect ou the tints, or else being good for nothing for the purpose."

## ON THE INFLUENCE OF MOISTURE UPON VARNISHED PLATES.

BY A. MIETHE.

VARNISHED gelatine emulsion plates frequently present an appearance resembling crystallisation. The glossy surface of the plate shows round or polygonal and confluent spots of silky lustre when viewed by reflected light, resembling infundibutate form. The phenomenon has a remarkable similarity with crystals derived from spreading the solution of an easily crystallisable salt upon a plane surface and crystallising by evaporation.

Experience has shown that moisture is the factor promoting the formation of these figures, and that in reality they can be produced at will, when the film has been sprinkled with a spray of water, or has been covered with a stratum of aluminium hydrate. They often occur spontaneously on plates kept in places not perfectly dry, or when plates in close proximity to each other are removed from a cold room to one of higher temperature. By transmitted light these spots appear of a brown colour, printing light upon a positive copy, even when but slightly visible.

Induced by repeated inquiry as to their possible cause, I have made a series of interesting experiments on the nature of these spots, and the means to remove them.

When examining them under an enlarging lens of limited power, their crystalline nature became discernible; the affected portions showed in polarised light a limited but distinct double light refraction, suggesting the separation of a crystallisable body, induced by the action of moisture, the nearest direct cause of the effect being sylvinic acid probably. But were that so, the same phenomena must certainly occur with any resinous film, when sufficiently moist. A variety of varnish films resting upon different supports, and exposed to a moist atmosphere, were then experimented with.

1. Commercial photographers' varnish upon a gelatine film showed spots after three-quarters of an hour.

2. Shellac varnish upon the same produced spots after ten minutes.

3. Negative varnish upon collodion; no action after 48 hours.

4. The same upon plate glass; none after 24 hours.

5. Japan (Scovill's crystalline) upon gelatine; spots after a few hours.

6. Japan upon chloride of silver collodion diapositives; no effect after 24 hours.

7. Japan upon a tanned pigment print showed spots after 24 hours; and—

8. Negative varnish upon a thoroughly tanned gelatine negative produced the same effect in 24 hours.

These unexpected results excluded altogether the crystallisation hypothesis, spots having occurred with japan, from which a formation of crystals is out of the question. The occurrence of spots depends furthermore upon the existence of a gelatine substratum, the time of producing them upon the aid of water, and the more or less tanned state of the film.

But how can we account for the double refraction of light, and the regular starry formation of spots with japan varnish? What has gelatine to do with the phenomenon, and why does it not occur with collodion films? When viewing the spots by reflected light, and under a powerful microscope, the absence of crystallisation becomes evident. Concentric curves, closely united with each other, and grouped around a common centre, are visible; they consist of narrow bands of varnish, resting not flatly upon the substratum; they are raised in annular form around the centre, imbricated, as it were, the single varnish bands appearing like shingles laid upon each other.

The forming of these structures has been examined under the microscope, and has led to the following explanation.

Through any of the pores, abundantly present in every varnish stratum, moisture enters till the gelatine film is reached; the gelatine begins to swell, the varnish surrounding is broken by this action, more moisture enters, another concentric varnish ring is formed, and so forth, till the above described figure is shaped. By the pressure exercised by one centre upon another, polygonal figures are produced similar to the polyhedric form resulting from soap bubble accumulations, as Plateau has shown. Has the varnish stratum or the gelatine film been scratched or torn, the formation of starry or leafy figures follows distinctly the direction of the fracture. The double light refraction is explained by the high tension of bent varnish particles, similar to that of glass when under pressure or expanded. Collodion plates do not show these effects, simply because a collodion film does not perceptibly swell in water.

But little has been done for the benefit of the practitioner by solving the above question scientifically, and explaining the ultimate cause of these spots, and we must yet consider the best way of how to avert them, or to remove them from where they exist.

Protect your gelatine negative from all possible influence of moisture.* This not being possible under all circumstances, thorough tanning of the gelatine film is highly recommended. A tanned film resists moisture very much, an untanned attracts it. Japan or crystalline varnish, not very liable to moisture in the atmosphere, is preferable to any other.

To remove these spots from varnished negatives is quite a tedious operation. The plate should be devarnished in the first place, soaked in water for several hours, dried quickly, and recoated with a very thin varnish. When the spots appear very dark by transmitted light, which mostly occurs with thickly varnished plates, they will be retained to some extent, even after that operation. Herr Gaedicke proposes to subject the plate after devarnishing to a strong alum bath, a remedy not effective enough in my hands. I have had much better results by brushing the plate repeatedly with a concentrated aqueous tannin solution to which a modicum of alcohol has been added, thoroughly washing it, drying quickly in a warm room, and the application of a new coat of varnish.

Plates treated in this manner show occasionally signs of the spots by reflected light; by looking through them, however, nothing of them is visible.—*The Photographic Times.*

---

Photographic Society of Great Britain.—On May 12th, at 8 p.m., M. Leon Vidal will read a paper on "Photographic Methods of Obtaining Polychromatic Impressions." It is hoped that a collection of coloured prints will be on view. May 26th, subject for discussion, "The Influence of Development on Gradation." June 9th, Mr. Leon Warnerke will read a paper on "A New Sensitometer."

* Coating of a well dried film with collodion, as proposed by Abney, will probably be effective.—Translator.

# Patent Intelligence.

### Applications for Letters Patent.

7,312. William Walker James Nicol, Mason College, Birmingham, "Improvements in Photographic Printing Processes."—April 28th.

7,376. Bernard Krantz and Hermann Zeissler, 61, Chancery Lane, London, "Improved Apparatus for Printing, Developing, and Finishing Photographic Prints."—April 29th.

7,409. Marshall Arthur Wier, 115, Cannon Street, London, "Improvements in Photographic Cameras."—April 29th.

7,586. Alfred Morgan Gillham, Oak Lodge, Wellington Road, Wanstead, London, "Stop for Photographic Lenses."—May 1st.

7,615. Fox Shew, 88, Newman Street, London, "New or Improved Light-tight Hinge for Shutters of Photographic Dark Slides."—May 2nd.

7,635. Eugen Hackh, 55, Chancery Lane, London, "Improvements in Magnesium Lights for Photographic and Signalling Purposes."—May 2nd.

### Specifications Published.

18,826. *November 23rd*, 1889.—"Photography." C. Lawrance, 141, Fulham Palace Road, London.

*Camera and Change-Box.*—This belongs to the detective class, and consists of a change-box arrangement, shutters, and other necessary parts. The sensitive plates are placed in zinc frames or sheaths, a number of which are combined together in book form, and placed on a shelf. The sides of the sheaths are notched, so as to fold down after exposure. The plates are pressed forward by a spiral spring, and each exposed plate, as it falls forward, is arrested and held in position by springs.

*Shutter.*—A flap shutter is used for covering the lens when necessary, and is held in the open or closed position by a spring. A mechanical shutter is fixed, and may be used for slow or rapid exposures.

19,205. *November 29th*, 1889.—"Photography." J. B. Payne, 33, Soho Square, Middlesex.—(*F. C. Binns, Wellington, New Zealand.*)

Relates to means of treating and mounting prints so as to give them a matt opal surface. An unpolished or ground plate of glass, &c., is coated with a "waxing compound," consisting of bees'-wax and yellow resin dissolved in spirits of turpentine, &c. This, when dry, is covered with a "gelatine zinc compound," which is made up of gelatine, zinc oxide, and glycerine, to which a suitable dye or pigment may be added. On the surface thus prepared is laid the print, face downwards, which is squeezed on to it. A backing is next laid on. When dry, the print, with its backing, is removed from the plate by a knife, &c.

19,319. *December 2nd*, 1889.—"Photography." A. Pearson, 5, New Station Street, Leeds.

Relates to cameras for producing lantern slides. A carrier, which holds the negative to be reduced, is held by flat springs, so that it can be adjusted in any required position. A space is left between the two parts of the camera to give easy access to the lens. Focussing is effected by the screw and rack, and a set screw may be fitted to clamp the camera in any given position. The gap in which the lens is placed may be covered by a focussing cloth when the apparatus is in use.

---

The International Exhibition arranged by the Vienna Amateur Photographers' Club was opened on May 4th by the Archduchess Maria Theresa. It contained about 600 photographs selected for the exhibition out of 4,000 sent in. Among the exhibitors are the Princess of Wales, the Archduchess Maria Theresa, the Grand Duke of Tuscany, Count Bardi, and both Barons de Rothschild. Among the works most admired are the landscapes of Mr. Thurston, "A Villa in the Prater," photographed by moonlight, and the photographs of Messrs. Alfred Maskell, Lyonel Clark, George Davison, and J. Gale. The opening of the Exhibition was attended by the Ministers, the Diplomatic Corps, and numerous distinguished visitors.

# Correspondence.

## THICKNESS OF GLASS FOR DRY PLATES.

Sir,—May I call your atteution to a subject which I venture to think requires consideration, and which I trust you may recognise as one worthy of public ventilation, viz., the thickness of glass used by manufacturers for the small sizes of photographic dry plates. In a packet of one dozen I have frequently found some a bare $\frac{1}{16}$ of an inch thick, whilst others have measured a full $\frac{1}{8}$ inch. In consequence, camera makers now allow a full $\frac{1}{8}$ inch of space in the dark slides for the accommodation of the dry plate. This means that the Alpine climber and the photographic traveller are compelled to carry unnecessary bulk and weight of wood as well as glass.

If plates of a uniform gauge of $\frac{1}{16}$ of an inch could be obtained, many hand-cameras of the magazine type might carry double the number of plates they now do without increasing the dimensions of the instruments.

I feel sure that the enterprising makers of dry plates will best study their own interests and those of the public by giving the matter most careful consideration. Such a decided reduction in bulk and weight, both of plates and apparatus, as would be effected if $\frac{1}{16}$ of an iuch were adopted as the gauge of plates for small field cameras, would tend to reduce the popularity of substances now, to some extent, employed as rivals to glass for supporting sensitive photographic surfaces.

Arthur Rayment.

99, *Hatton Garden, London, E.C., May 2nd.*

## THE PROFESSIONAL SHOW-CASE.

Sir,—I have read with interest the articles recently published in your columns by the Rev. F. C. Lambert on the above subject. I fancy that the reverend gentleman is better acquainted with the theoretical than with the practical part of our business, and I trust that he will forgive me for saying so. What does he think our laudlords would say to the idea of cutting recesses in our walls for the accommodation of show-cases? I am sure that mine would strongly object to such a course, and even if he consented to this cutting about of his property, the walls are so thin in this—as iu most London houses—that the back of the case would most certainly obtrude itself into the adjoining premises. Your reverend correspondent is, of course, more used to church architecture than to the domestic variety, and we know that ecclesiastical buildings have walls of great thickness, and many recesses. Perhaps he had these in his mind when he penned the matter referred to.

Practical.

## THE WOLF AND THE LAMB.

Sir,—I have a grievance agaiust the General Post Office which, in the interests of the entire trade, should, I think, be made public.

The facts are these. Having been favoured with an order by a customer in the West of Englaud for an enlarged negative, 12 by 10, I, on the 3rd of April, despatched the same, carefully packed, to its destination by Parcel Post. On the 7th of April I received uotice from my correspondent that the negative had arrived brokeu (in two pieces only), he, a commercial man, admitting that it was well and carefully packed. I immediately posted my correspondent's letter to the secretary of the G.P.O., and received on the 9th of April the usual formal acknowledgment, which, I noted, contained the following clause: "It should at once be stated, however, that photographic negatives are considered by the Department to be of such an exceptionally fragile nature, that compensation for damage cau only be given where there is clear evidence of negligence or wilful injury in the post."

Though, in my printed list, I expressly state that "all possible care is taken of negatives, but *no responsibility* is undertaken for injury while printing or during transit," I nevertheless made and despatched immediately, *packed in an exactly similar manner*, a second negative, wishing to spare my correspondent inconvenience from delay, pending the remittance from the G.P.O.; but, in view of the above clause in my list, and feeling my lamb-like helplessness in any argument with the official wolf, I charged my customer *half* the usual cost.

On the 18th of April, the following to hand (I quote from the letter): —"I received the 12 by 10 negative this time all safely. I cannot, however, understand the invoice. You charge me with half the risk of the first uegative which was broken, *but you have, of course (or will have), got your 8s. 6d. from the postal authorities.* An official from the post office called to see the broken uegative and box a few days siuce, *and appeared satisfied it was well packed, and that the damage must have been due to rough usage in the post.*"

Similar personal attentiou was evinced in the matter at this end by *two* calls from an official at these works, and on the second occasion he left me so convinced that I should receive what can only be regarded as *just* compensation, that I cancelled the claim ou my customer for half risk.

Judge, therefore, of my surprise at receiving this morning the following:—

"Sir,—With reference to your applicatiou of the 8th inst., I have to inform you that careful inquiry has been made at each of the offices through which the parcel sent by you passed, but nothing has been elicited to afford grouud for supposing that it received rough usage or wilful injury during transit, and when delivered it was, to outward appearance, in good condition. *In the circumstances and for reasons* stated in my communicatiou of the 9th ult., your claim for compensation cannot be allowed. The postage cannot be refunded.—I am, sir, your obedient servant, S. A. Blackwood, Secretary."

Now, sir, as an interested party, I am fully aware that "my opinion" must go for what it is worth, but I should be pleased to hear your opinion, and that of some of your readers, for whom the matter may possess commercial interest, on the abstract case of two boxes, admittedly adequate in strength, each containing a piece of glass 12 by 10, admittedly well packed, each travelling 250 miles by parcel post, each to all outward appearance in good condition when delivered, yet the glass iu one iustance is whole, while the other is broken iuto two pieces only.

Why, sir, the *careful inquiry* consisted, I presume, in a few questions to the parcel carrier, who could hardly be expected to criminate himself by saying he let the parcel fall, or while sorting *threw* it from one side of a room to the other (which I am informed *is* doue); and I maintain that the *slight* damage of being broken into *two pieces* is the best possible evidence "*to afford ground for supposing that it received rough usage during transit,*" for only a sudden, jarring concussion could have done it *in the circumstances and for the reasons*, which must be appareut to any but an official wolf having a lamb at his mercy.

J. Martin,

*Printing and Enlarging Works, 4 and 3, Park Villas, New Southgate, N., 2nd May.*

## PRINTING ON ALBUMENISED PAPERS.

Sir,—As the writer of the letter in your last issue on printing on albumenised paper invites others to state their experience, it is only due to the makers to say that Edwards' double albumenised paper is giving me first-rate satisfaction; an occasional blister may form, but nothing to complain of, and in every way the paper is good and even iu quality. We use hard well water all through.

E. W.

---

For want of space we must defer our report of Mr. Valentine Blanchard's lecture at the Polytechnic, Regent Street, on Wednesday evening last, until next week. We may, however, mention that the lecture was well attended, and was received with every demonstration of satisfaction by the audience.

Holborn Camera Club.—At the meeting held ou Friday last, Mr. T. O. Dear in the chair, Mr. James Sharpe and Miss C. H. Morgan were elected members of the Club; and Mr. E. H. Bayston read an article from *Adams' Annual* on "Photographic Shutters," illustrating the article by showing several form of shutters uow ou the market.

# Proceedings of Societies.

Camera Club.

*April 30th.*—Mr. Lyonel Clark took the chair.

The Secretary handed round specimens of clear gelatine for lantern slide purposes, brought to the meeting by Mr. S. T. Chang.

Mr. J. Traill Taylor then read a paper on "Lantern Optics," in which he first discussed the essential qualities of the several parts of the optical lantern, and then proceeded to describe a special form of condenser calculated to supply the most perfect conditions for working.

Commander Gladstone, amongst others, discussed the quality of glass used in lantern condensers. The greenish glass not only cut off the light, but affected the colour of the print. He thought that no doubt the system advocated by Mr. Taylor was the right one.

Mr. Elder mentioned Professor Boys' method of protecting his condensers from heat.

The discussion was carried on by Messrs. W. H. Harrison, Kapteyn, Little, and the Chairman.

Thursday, May 14th, will be a lantern evening.

National Association of Professional Photographers of Great Britain and Ireland.

A meeting was held on Thursday, April 30th, at the Talbot Hotel, Sheffield, in connection with the above Society. The object was the formation of a Sheffield district branch.

The Chairman, Mr. J. Crosby, Rotherham, explained to those present the objects of the N.A.P.P., how and where the scheme for such a society had first originated.

The members decided that a branch should be formed, and pledged themselves to support it to their uttermost.

The following were elected to the respective official posts:—*Chairman*—Mr. J. Crosby (Rotherham); *Vice-Chairman*—Mr. Dakin (Sheffield); *Treasurer*—Mr. Dickinson (Sheffield); *Committee*—Messrs. A. Seaman (Chesterfield), Yates (Sheffield), J. E. Edison (Barnsley), Whaley (Doncaster), Ainley (Sheffield), Shingler (Sheffield), and Wilkinson (Sheffield); *Secretary*—Mr. A. E. Yates (Sheffield).

The next meeting was decided to be held on May 26th at seven o'clock.

Richmond Amateur Photographic Society.

*May 1st.*—Mr. Ardaseer in the chair. The subject of debate was "Hand-Cameras," and, many makers having responded to the secretary's invitation to send an exhibit, members had the opportunity of inspecting many of the best known types, and, in several instances, having them explained by representatives of the manufacturing firms.

Mr. Parker showed his "Companion" hand-camera, claiming on its behalf extreme simplicity of movement. Mr. Smith, of the Eastman Company, had specimens of the whole series of kodaks, eight in number, and explained their working and distinctive characteristics, touching also upon the manipulation of the rollable film. This led to a short discussion upon films, the merits of which were warmly espoused by Major Nott. Mr. Smith also showed two 15 by 12 enlargements from kodak negatives. A representative of Messrs. Marion and Co. showed the "Radial" with its novel plate-changing arrangement, and Messrs. Mawson and Swan followed with the original and improved pattern "Reflex," which has a focussing mirror and roller-blind shutter working next the plate. Messrs. Watson and Sons had sent the "Vanneck," which was explained by the secretary, and Mr. Cembrano had been entrusted with, and described specimens of, the "Zodiac" by the London Stereoscopic Co., the improved "Facile" by Fallowfield, and the "Key" of the Platinotype Co. Members present also showed hand-cameras of which they were the owners, stating their merits and drawbacks. Commander Tudor produced Shew's "Eclipse"; Mr. Ramsay, Watson's old pattern and the Stereoscopic Co.'s "Artist" (twin lens); Mr. Garrett the "Ideal" (Adams); Major Nott a camera of his own design of extreme lightness and simplicity, which had done good work all the world over; and Mr. Cembrano wound up an instructive evening by showing a camera designed for use with several different lenses, and just specially made for him by Mr. Newman.

Croydon Microscopical and Natural History Club (Photographic Section).

*May 1st.*—In the Club room, Mr. J. A. Carter, M.A., in the chair.

Mr. D. E. Goddard, F.R.M.S., read a paper on "Elementary Silver Printing," and, in an interesting way, set forth the whole routine of silver work, from sensitising paper to the finished and mounted picture. A series of pictures showing results to be obtained by printing under different coloured glasses were exhibited.

At the conclusion a discussion ensued, in which Messrs. J. Weir Brown, Marriott, and the chairman took part.

May 9th, whole day excursion to Arundel.

Bath Photographic Society.

*April 29th.*—Mr. W. Pumphrey, president, in the chair.

The Chairman spoke in feeling terms of the loss by death of a member, Mr. F. J. Saunders, and a letter of condolence with the deceased member's family was ordered to be sent from the Society.

Mr. Ernest Lambert next discoursed on the subject of employing single meniscus lenses for large portraiture, illustrating his remarks with several head and bust portraits about half life size. Mr. Lambert said he was led to work in this direction from a careful perusal of Dr. P. H. Emerson's book, "East Anglian Life." The lens he used did not give an abnormally protracted exposure; eight seconds was about the average, and back focus varied from 48 to 60 inches. The working aperture was about $2\frac{1}{2}$ inches diameter.

The Chairman thought there was a good deal of merit in the examples shown. With a single lens there would be less refraction and more brilliancy. As to the result, all were not agreed as to how sharp a flat print ought to be. In nature the eye accommodated itself with great rapidity to focussing objects at any distance, and objects represented on a flat surface, if unsharp, might appear disappointing.

Mr. P. Braham, Mr. W. Harbutt, and Mr. W. Middleton Ashman took part in the discussion.

The Chairman, alluding to the progress made towards the convention meeting, said that a local committee was now formed, and that Mr. E. J. Appleby had accepted the post of hon. local secretary.

Liverpool Amateur Photographic Association.

A meeting was held at the Association's Club Rooms on the 30th April, Mr. Paul Lange in the chair. The following were elected members of the Association: Messrs. W. R. Melly, W. N. Samuelson, I. Pickering Jones, Thomas Wynne, M. Ganders, C. F. Burne, and W. Elsworth.

The President exhibited Mr. Friese Greene's hand-camera, enabling as many as sixty consecutive photographs to be taken in one minute.

Mr. John Price exhibited and explained Voigtlander's (5 by 4) hand-camera lens; also Ross and Co's. universal symmetrical lens, new rapid series.

Mr. J. T. Norman Thomas showed a framed picture of a view on a lake, which represented four swans in the foreground, whereas, when the photograph was taken, there were only two on the water.

A number of reasons for the phenomenon were given (some of them amusing), the most likely being that a double exposure had been given, and the swans, in the meantime, had sailed nearer to the camera.

Mr. Thomas S. Mayne, exhibition secretary, then made a statement regarding the probable financial results of that undertaking. The accounts, it was expected, would be ready for the meeting on the 28th inst. Although the success had far exceeded all expectations, the expenses had been very heavy;

but it was anticipated the nett profit would be about equal to that of the former exhibition of 1888, which resulted in £250 being handed to the Society's treasurer.

Mr. John Woolfall explained the progress that was being made to get the long-delayed return Boston set of slides completed, viz., "Illustrated Liverpool."

The President drew attention to the excursions for the present season, the first of which had been arranged for Saturday, 9th inst. (whole day), to Chirk and district. Permission had been obtained from Col. Myddleton Biddulph to photograph the castle. An excursion would be made to Quinta, another beautiful mansion, a Chatsworth in miniature.

Mr. J. A. Furnival, of Manchester, then proceeded to give a description of the optical lantern, explaining its various parts, and, after the lantern had been lighted up, gave some curious sound experiments, which represented waves of sound of the human voice on the screen. Microscopic slides were also shown, and the adaptability of the lantern to microscopic work explained.

---

### Brechin Photographic Association.

The last ordinary monthly meeting for the session was held on Tuesday evening, 5th inst., Mr. Wm. Stewart, jun., in the chair.

It was intimated that the committee had arranged to allow visitors to have the use of the reading room and dark room at the nominal charge of one shilling per month.

The secretary, Mr. J. D. Ross, read a short paper on "Stereoscopic Photography with a Quarter-Plate Camera." Although not advocating the use of such a camera for the best stereoscopic work, he pointed out that a stereoscopic camera is not essential to the production of stereoscopic slides, and, in proof, exhibited a number of transparencies and other slides taken with a small camera without extra top for stand or any extra apparatus.

---

### Photographic Society of Philadelphia.

A meeting was held on April 8th, Mr. John G. Bullock in the chair.

The Secretary exhibited a new shutter, the invention of Mr. H. B. Morton, of Minneapolis, known as "The Cloud Catcher." The shutter was of the rotary form, attached to the hood of the lens. The opening in the leaf was of a peculiar shape, allowing full exposure to the foreground and landscape, with considerably less for the sky or distance. The shape and size of the opening could be readily changed to suit the character of the view or intensity of the light.

A modification of the kodak camera was shown, being the contrivance of Mr. S. Ashton Hand, by which the roll-holder could be removed and five double holders put in its place. A ground-glass screen was also provided, which enabled the operator to properly focus a view, as with an ordinary camera. An acid fixing bath in solid form, in the shape of a powder to be dissolved as required, and also a portable developing powder, to which the name of "Phainogen" had been given, were shown.

On the subject of "New Developers," Dr. Mitchell said that there had been a great deal of discussion among members of societies and in scientific journals during the past five or six years, relative to the merits of eikonogen, pyro, hydrochinon, and a combination of these different ingredients. He believed that the two best results were obtained by first developing the negative in pyro, and then following with a solution of eikonogen; and secondly, by developing the negative with hydrochinon, and then following with eikonogen.

Mr. Carbutt said that he had come to the conclusion that, at the present time, a mixture of hydrochinon and eikonogen was the best developer of the day. The two combined—using about two of eikonogen to one of hydrochinon—would give a developer containing the good qualities of both.

Considerable discussion arose at this point in regard to the merits of exposure-meters, in particular the Watkins exposure-meter.

Mr. Charles R. Pancoast, president of the Waterbury Photographic Society, said that last spring, about the middle of April, he made an exposure of Carbutt's B 20 plates, with a Dallmeyer rapid rectilinear lens, stop F 32, and two or three seconds was amply sufficient for a fine negative. Taking these same plates in June, when one would presume the actinic power to be greater, five or six seconds was hardly enough.

Dr. Mitchell said the only exposure-meter of any real scientific value he knew of was the Watkins exposure-meter. Most of the others were conducted on the plan of placing the meter against the ground glass and observing the amount of light, which was rather an unsatisfactory way of judging. Referring to Mr. Pancoast's experiences, Dr. Mitchell said that, on a very bright day, he had often found little actinic power, while on other days, probably overcast, he had found the light act upon his plates very quickly.

Mr. Coates asked whether it was not possible for the makers of plates to come together and agree upon some common basis for designation of the sensitiveness of plates, so that the numbers would always mean the same thing. In his opinion, it was very important that makers should agree upon some uniform basis. As it was, one maker's sensitometer 40 was about equivalent to some other person's 30.

Dr. Mitchell said it seemed to him the only way to attain the desired uniformity would be pressure, and he thought, if this thing was presented in the right way, and through the different societies of the country, it would carry an amount of weight that would influence the action of the plate makers. It only depended upon placing it before them in such a way as to make it appear to their interest to do what was required of them.

After considerable discussion, Mr. Stirling moved that a special committee be appointed by the president to take into consideration the feasibility of starting a movement looking to a uniform method of marking plates, the committee to report to the Society, which was carried.

Mr. Chapman narrated an experience he had had with some pyro developer which he had left in the sunlight with the stopper out. The sun turned the solution to a port wine colour. It was a single solution developer, but with it he could build up to any depth without fog, and get dense black negatives on instantaneous exposures. He had not been able to do such work with fresh pyro, kept from the light, or with old pyro with fresh solution added to it. He used it for six months or more, and always got powerful negatives from instantaneous exposures.

Mr. Julius F. Sachse read a paper entitled "A Suggestion for a Possible Method of Identifying the Colours Photographed" (see page 354), illustrating his experiments with various prints, and exhibiting also a few lantern slides.

Dr. Skinner, an eminent entomologist, who was present, said that this would undoubtedly have great scientific value. The trouble with the present method was that it precluded the possibility of illustrating a great many natural history objects, on account of the great expense. The larger and showier species of insects had been illustrated, but the great majority had not, especially in this country. It was a great desideratum to have these things illustrated, because, of course, numerous discussions were had on them; but it was very laborious to attempt to make anything out from these discussions without having coloured illustrations, or illustrations showing what the colours might be. They could see at a glance the advantages that would accrue from this new method, when it would take anywhere from an hour to a week to hunt up from numerous descriptions the colour values of an object under discussion. The present method on stone was very expensive, took a great deal of time, besides requiring the services of an artist to make drawings, and then the lithographic work, the printing, and finally the colouring by hand. He sincerely hoped that some method of the kind outlined by Mr. Sachse would become successful.

Mr. Carbutt said that the method of illustrating books now by the half-tone process had reached such a state of perfection that he thought, with the aid of orthochromatic photography, it should be possible to make the illustrations for scientific works, with colour patches at the foot of each, made to match the colour of the object, and using the same as a key, as successfully represented by Mr. Sachse. This would save all the research and description of the colours of the objects. He thought it would be of great value, because a person could, by its means, carry in his eye (having the key below) the colour the bird or fly might possess.

The Chairman enquired if Mr. Sachse knew whether the sample tissue colours shown were aniline colours or not. Some of these colours were very fugitive.

Mr. Sachse said he could not answer that question. He had used these tissue colours, on the spur of the moment, as the best set of colours he could get. Of course he would try to match the colours exactly—probably by the use of water colours—but the examples he had used were merely ordiuary commercial samples of tissue paper, the best he could get.

Mr. Cheyney asked whether it would not be possible to flow orthochromatic plates with a stained soluble gelatine, which would act as a colour screen, and thus avoid the necessity of carrying screens to be placed in front of the lens.

Mr. Carbutt said he could only answer that in a theoretical way. He had never tried the experiment, yet did not see why it should not answer. The disadvantages would be, however, that one would be compelled to use the fixed plate as it was, while under present conditions he could use the plate with or without screen, or vary it from the light yellow to the orange, as he desired. This, he thought, was the better plan.

---

Photo-Mechanical Prints with an Ordinary Copying Press.—A Russian photographic paper publishes the following: "On a thick sheet of glass I obtain a cliché by means of bichromated gelatine, which, after developing, I leave to dry at the ordinary temperature for twenty-four hours, after which I flood it with the following 'bain mouilleur': Water, 100 c.c.; glycerine, 200 c.c.; hyposulphite, 2 grammes. This is allowed to act from one to two hours, according to the desired relief. Then I remove the liquid from the glass by means of a very soft pad and blotting paper, and then I ink up the cliché by means of a gelatine roller. The first pull or two are generally poor, and are somewhat spoilt by the dampness of the cliché, but the subsequent impressions are excellent. In order to print iu the copying press, I lay the inked clichés on a piece of india-rubber cloth, a mask of paraffin paper, and theu the paper on which I wish to have the impression, and over this a thin bag of fine cloth filled with wadding. It is the use of this blanket which makes it possible to press the paper into coutact, and to obtain all the fineness and details of the cliché. Of all the formulæ I have tried for the 'bain mouilleur,' I have found the above the best, as well for the relief as for the number of impressions. If after about twenty pulls the details of the high lights begin to show grey, one only need damp the cliché with a pad dipped in the same liquid, in order to make it as good as ever."

Royal Society.—At the meeting held at Burlington House, London, on Thursday, a paper, entitled "Cloud Photography conducted under the Meteorological Council at the Kew Observatory," by Lieut.-General R. Strachey, R.E., F.R.S., and G. M. Whipple, B.Sc., F.R.A.S., superintendent of the Observatory, was read. The authors described the work which had been in progress under their charge since 1878, illustrating it copiously with lantern slides and photographs, many of which were admitted by those who saw them to be uuique and of great beauty, while the methods they employed for determining the heights of the clouds above the earth's surface, and the system adopted for finding the rate of motion of the currents of air in which they floated, were commented upon by the president, Sir William Thompson, Lord Rayleigh, the secretary, and other speakers, as extremely ingenious, aud being capable of rendering far more accurate results than any others hitherto employed, either at home or abroad. The range of observations in the list of results given by the authors extended from clouds floating less than one and a half miles high in air, moving at seven miles per hour to niue miles above the ground, in gales blowing sixty-five miles an hour, whilst the surface wind was only a gentle breeze of five miles per hour. The advantages of a knowledge of such aerial investigations in the preparation of weather forecasts was ably pointed out by Mr. Symons, the secretary of the Royal Meteorological Society.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

V. B. R.—*Cabinet Mounts.* The cardboard contaius very little chloride, but so large an amount of sulphate of lime (plaster of Paris) as to be positively objectionable. The reduction of this sulphate to sulphide, by organic matter under the influence of moisture and sunshiue, may very possibly account for the yellow staining of the silver film which is now so very marked. Where screened from light, this sulphuration does not appear to have taken place, neither is there any fading.

J. M. Briggs.—*Estimation of Silver.* The hydrometer test would probably meet your case, beiug sufficiently near for all practical purposes. But if you wish to be exact, precipitate, say, two drams of the silver bath with an excess of hydrochloric acid, wash the heavy chloride once or twice with warm water by decantation, draiu closely, and dry nearly to the poiut of fusion in a tared porcelaiu crucible; 143·5 parts by weight of dry chloride correspond to 170 of nitrate of silver; then multiply by four to give the number of grains of real nitrate per fluid ounce.

Referee.—*Operator's Duties.* All depends upou your original agreement, but it cannot be to your advantage to engage a skilled operator to do the work of an ordinary printer. He might be asked to assist in retouching, enlarging, and working-up residues, if you have any occasion for these services. It is possible to overweight the establishment by carrying the division of labour too far in quiet seasons.

A. C. (Macclesfield).—*Cracked Negative.* Try the method of rubbing iu lamp-black, which often succeeds, or at least gives you a print that requires very little working-up by hand.

G. G. M. and F. D. T. (Ediuburgh).—*Historical Photographs.* An excellent portrait of Daguerre (6 in. by 5 in.), together with a photo-lithographed reproduction of the partnership deed drawn up between Nicephore Niepce and Daguerre, appears iu the new monthly, *Paris Photographe*, edited by M. Paul Nadar (Paris: 53, Rue des Mathurins; price 2 fr. 50 c.). You would do well to get this copy.

V. McC.—*Gold Line round Photo on Glass.* If you mean a narrow gold edging, this is done with gold leaf upon the glass itself, properly prepared with oil gold size, or varnish. No pen is required, for it is not done with the so-called gold ink, which, being only a bronze powder, would cause the speedy destruction of a silver photograph laid in contact.

F. R. I. B. A.—*The Renaissance in England.* We called upou the publisher this week, who showed us Part I. of the new work, containing eighteen reproductions from photographs, size 14 by 10 inches, executed by Sinsel, Dorn, and Co., of Leipsig. They are for the most part entirely satisfactory, but two or three of the plates, probably from the nature of the subjects, appear to be grey and flat.

Urban.—*The Crystal Palace Exhibition* closed on Saturday last, so it is now too late to thiuk about coming up to see it.

M. C. (Paisley).—*Aristotype.* Slow toning is a common difficulty; you should try a borax-gold bath made rather strong, and give plenty of time. The priuts are not ouly red, but injured in the mounting, probably from being rolled before they were quite dry. The process is not so easy as with albumenised paper, aud your pretty cabinet print only proves the fact.

C. N. and Co.—*Reducing Furnace for Residues.* Make friends with the nearest brass founder, or his bricklayer, and get him to come and put up such a furnace as he would use. It is simply a square chamber, lined with fire-bricks set in Stourbridge clay, with sunkeu ash pit, cast-iron fire bars, and flattened square flue leading from the back of the furnace into an ordinary upright chimney. A flat, movable slab—iron-bound, Stourbridge square—to cover the top. The fuel is coke.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1706.—*May* 15, 1891.

CONTENTS.



## A PHOTOGRAPHER AMONGST IMPRESSIONIST PICTURES.

BY GEORGE DAVISON.

Of the several exhibitions now running, the one which photographers will perhaps do best to visit is that being held by the New English Art Club at the Dudley Gallery. The result of a first and superficial examination upon a visitor new to the work of these painters may be to provoke a smile of superiority. The gallery-going public, steeped in the pervading influence of the orthodox exhibitions, loses a true sense of the way many things really look. Long experience of conventional treatment as to point of view, colour, and subject, seems to destroy our power of seeing anything else as natural. Photographers know that something of this kind is true of the movements of animals. The public estimate of what is a correct representation of the gallop of a horse is formed from the average of the great mass of published illustrations drawn by artists. These are, perhaps, not the best artists, and we may learn to see differently from closer observation, from the facts seized and shown us by the more observant ones, or from judiciously selected photographs. The same observation holds good of other matters, such as facts of colour, light, subject, and point of view. Any development that breaks out of a slavish groove, and that opens our eyes to see common things in a new and true way, makes for freedom and livelier pleasure, the joy of the discoverer. Some of the pictures at the Dudley Gallery, on full acquaintance and study, do this in a very charming way. Eccentricity for eccentricity's sake will always provoke ridicule, but that which we think eccentricity may be our own ignorance or conventionality. The Philistine visitor to the New English Art Club Exhibition does not stop long enough to understand his men and their work. They have worked from knowledge, and some of them have much to teach. A stranger who careers round the gallery to quiz frames, colour, subject, and methods superficially, will, no doubt, have, above everything, a feeling of whimsicalities; but the unbiassed observer who cares to stop long enough to know the pictures will find his estimate change. The Exhibition grows upon the mind in a very noticeable way. The colour which, at first, seemed crude gains naturalness, and figures that struck the sense as wooden reveal some fresh and beautiful fact on better acquaintance. Most of these men seem to have had something new to say, and they give it in the most direct method. Perhaps, in giving one particular fact or phase, there is at times a disregard of other common actualities, but generally the artist's meaning is worth finding out. Even where the genius of imitation, the power of subtle characterisation, is absent, the work is generally suggestive and useful. The mere working under comparatively unconventional principles has its influence in spreading those principles. Schools and coteries may be a mistake in art, but it is a way nature has of working, and more of the New English Art Club spirit is what is now wanted. Some of the pictures, such as Nos. 9, 12, 13, I confess I have not as yet understood, but doubtless the artists themselves knew their intention. They cannot be expected to speak down to uncultured sense. Some, again, would probably look better in other than the gallery light. Altogether, a thorough and an open-minded study of the collection will leave the visitor with a very different impression from that gained from a first and prejudiced observation. It is an interesting test, after becoming steeped in the spirit of the Dudley Gallery, to walk into a neighbouring gallery, where the work is of a more conventional type.

There is a special feature in the Exhibition which makes me draw the attention of photographers to it. In the centre of the gallery a large portfolio of photographs of the actual paintings on the walls is placed open for inspection. The photographs appear to be in sepia platinotype, and are by Mr. Fred. Hollyer. Such an opportunity for comparison is of considerable value to the photographer. It helps him materially in understanding the qualities of the works on the walls, and probably removes some prejudices. The photographs are a lesson in translation of colour into tone. They show how imperfect colour may weaken a painting, for in one or two cases the effect of the photograph is more distinguished than that of the painting. They show, also, how much too black the majority of out-door-taken photographs are in their shadows. They are beautiful as direct photographs are rarely beautiful. Something of this attraction lies, no doubt, in the reproduction of the painter's touch in the photograph. We grow to admire handling, perhaps, far too greatly, but still there is always a charm in the felicity of imitation gained by a simple stroke of the brush—the simpler the touch or means, the greater the charm.

Some of the photographs fail in rendering accurately the delicate colour relations, but the excellence of others is just as noteworthy. The reproduction of the very powerful picture entitled "Dieppe," painted by Mr. Walter Sickert, is exceedingly good, and makes one conclude that Mr. Hollyer used orthochromatic plates and screens in his work. Photographers should not fail to examine this and all the photographs with the originals in the gallery. A more interesting and instructive study, even if it lowers photographic conceit, could hardly be provided.

One of the most noticeable pictures in the gallery is No. 33, "Portrait of Mrs. Cyprian Williams and her two little girls," by Mr. P. Wilson Steer. We are frequently given portraits of people seated in arm-chairs, and the conventional view is as seen from the height of the eye of the painter as he sits at his easel. Mr. Steer's view is from the height of one standing, not an uncommon aspect, as everyone will admit. However, we are so accustomed to the ordinary thing that a first and prejudiced impression is that Mr. Steer must have got upon a table or the top of a pair of steps to plan the arrangement; but a simple experiment at home reveals our ignorance, and shows us how blindly we go about. Apart from this, also, notwithstanding an impression of "dolliness" about the little girls, the picture grows upon one, and the portrait is real and living. Another characteristic picture by the same artist is No. 15, "Ballerina Assoluta," an impression of the light and perspective of a theatre stage, with a ballet dancer as seen from a side box high up. The picture is a very long one; the "première danseuse" is at the extreme bottom towards one corner; the stage itself, with streams of light athwart it, forms the background. It is quite safe to say that Mr. Steer knows, from his study of it, more about the truth of this view than anybody who is likely to criticise it, but the one thing that struck me was that the length of the figure was too great for the perspective of the stage and the downward direction of the sight. The light effect would, perhaps, show better in some other situation and light than the gallery affords. Indeed, although the judicious selection in the Dudley Gallery is pleasant after the jam-cram arrangement of the Academy and some other galleries, still the pictures call for such separate treatment as hardly any gallery could be expected to afford.

A noticeable subject is No. 4, "The Skating Rink," by Mr. George Thomson. At first, to a Philistine, this may seem inexplicable or advertisement-like in seeming woodenness, but the go of the figures in one direction, and the electric lighting, have been the aim of the artist, and the effect is not soon forgotten. The vividness of the bit of green upon the lady near the centre of the picture was a stumbling-block to me, and it did not say its word to me, although I waited humbly for it. In Mr. Thomson's other work, No. 11, "At the Window," there is much that is worth studying, but the funnels of the steam-launches appear to be a good deal nearer than the launches themselves.

A picture which has a peculiar fascination is No. 81, "The Common," by Mr. Francis Bate. At first, nothing but the vivid green expanse of foreground can be felt; but on coming and coming again and again, as it is impossible to avoid, this staring character becomes grass in sunshine, and it is one of the prominent memories of the Exhibition.

To mention briefly some of the remaining pictures, where almost all are striking, I would point to No. 1, a clever study of a head, by G. P. Jacomb Hood; No. 20, "Brighton," by Theodore Roussel; No. 22, "Changing Pasture," by A. B. Docharty; No. 26, "The Pink Rose," by J. E. Blanche (note the harmonious frame); No. 34, pastoral, by E. A. Walton, full of life and suggestion; Nos. 48 and 59, popular and delightful pictures, by Harrington Mann; No. 45, "Gathering the Flock," by W. J. Laidlay; No. 50, "'Twixt River and Broad," a delicate bit of pale orange and green, by J. Reffitt Oldfield; and also Nos. 62, 67, 70, 77, 86, 90 (note comparison of outdoor and indoor light), 98 (a fine picture, but is the perspective right from any point of view?), 101, and 105 (done rather as though on opal).

No. 88, "October Ploughing," has some attraction, in spite of many eccentricities. The ploughman's gait reminds one somewhat of the postman in the clever mechanical toy recently in fashion, his bell-trousers have an East-end character about them, the ploughing seems to be going on upon a carpet, a tree grows out of the plough, and the horses have short bodies, long legs, and a queer fixing of their heads. A key would possibly open our eyes, and Mr. Brown Macdougall could, no doubt, supply the key. There are several of the pictures about which the visitor, if he be not too clever, finds himself sitting at the feet of the artists, looking somewhat as a novice examines a photograph in the stereoscope—that is, in a waiting, enquiring attitude, expecting the meaning and truth to burst upon the mind. In most cases this result, when it comes, is worth the waiting for, and it stays. I can only repeat, go and see the pictures.

---

West London Society.—The annual smoking concert was held at the Richmond Hotel, Shepherd's Bush, on May 9th. The attendance was somewhat small, but the entertainment was good, and highly appreciated.

The Lowestoft and District Photographic Society.—A Society under this name was formed on the 5th inst. Mr. F. Mayhew was elected president; Mr. W. J. Roberts, treasurer; Mr. W. Stringfield, chairman; and Miss A. Lee Stringfield, secretary. It was decided to communicate with the committee of the School of Art with a view of this Society forming a technical class in connection with that Institution.

## PHOTOGRAPHY IN AUSTRIA.

NATURE PRINTING—ALUMINIUM LIGHT—TOLUOL MATT VARNISH.

AT the meeting of the Photographic Society on the 20th January, 1891, was read a paper on an historical process. It is not, however, a purely photographic subject which is in question, but the discovery known under the name of "Nature Printing," but now existing only in the shape of Woodburytype. Some people, doubtless, still remember the melancholy Henry Bradbury, the son of Dicken's and Thackeray's publisher of the house of Bradbury and Evans, and himself founder of the firm of Bradbury and Wilkinson, who died in 1860. In 1850, while still a young man, he was a pupil at the State Printing Office in Vienna, just at the time when the discovery was made that it is possible to take impressions of leaves on soft lead and then produce images in intaglio from them by means of galvano-plastics. In this way illustrations were made not only of twigs, but of whole plants. Also cut agates and other veined stones were corroded, and impressions of them taken in this same manner. The affinity of this process to Woodburytype is manifest. In England it was patented by Bradbury. The Austrian patent is dated 12th October, 1852, but the process was thrown open to public use. In proud self-consciousness at that time Auer, the father of the discoverer of the net on incandescent gas-burners, said Russia made Jacobi's use of galvano-plastic free in the year 1837; France, Daguerreotype in 1839. Now Austria has furnished a worthy companion to the two discoveries. But the graphic arts took another direction, and "Nature Printing" was forgotten. Nor was this the first time, for, as Mr. Einsle proved at the January sitting of the Photographic Society, the same process was discovered in 1763. He showed the meeting a book entitled: "Die Nahrungs-Gefaesse in den Blaettern der Baeume nach ihrer unterschiedlichen Austheilung und Zusammen fuegung sowie solche die Natur selbst bildet, abgedruckt von Johann Michael Seligmann, Kupferstecher in Nuernberg. Nebst Tit. Herrn Hof. Raths Christoph Jacob Treue Historischer Bericht von der Anatomie der Pflanzen und von der Absicht dieses Workes. Nuernberg, gedruckt bey Johann Joseph Fleischmann, 1748." This book contains coloured illustrations of leaves exactly like those produced by nature printing, except that they appear to be from relief plates, whereas Auer prepared copper plates. We can obtain only one passing hint as to the manner in which the old Nuremberg master went to work, viz., on page 4, where he says "he will print the thus prepared vessels (*i.e.*, the skeleton leaves) themselves . . . . because it would be impossible to imitate nature perfectly by drawing or copperplate engraving." The second preface, which begins to describe the process employed, is imperfect in the copies of the book to be found here. Should any readers of this journal possess a complete copy, it would be interesting to learn from the second preface in what way Seligmann prepared his plates. Communications on the subject may be addressed to Herr Einsle, Antiquary, Vienna.

*Aluminium Light.*—At the sitting of the Photographic Society on the 3rd March was shown a picture taken by aluminium light. Powdered aluminium, or aluminium waste from the leaf, burns in a spirit of wine flame, although more slowly than magnesium. But with bodies which give off oxygen, or in oxygen itself, it produces an extremely actinic light, and also without smoke, which is its chief advantage. As the experiments are being continued, and as the fact that Messrs. F. Probst and Max Putz are conducting them offers a certain guarantee of success, I hope another time to be able to report again. At present we have some very nice specimen pictures taken by it.

*A New Matt Varnish with Toluol.**—That part of coal-tar which passes over between 100° and 130° centigrade contains essentially toluol (toluene) besides a little benzene. This is the toluol of commerce. It is not so valuable as benzene, boiling at 110° C.; benzene boils at 8° C. Like benzene, toluol has the property of separating resin from an ether solution of sandarac, but toluol possesses this quality in a higher degree than benzene. In order to obtain a matt varnish from 100 c.m.$^3$ of an ether solution of sandarac 1 ÷ 9, an addition of 45-50 c.m.$^3$ of benzene is necessary. In my experiments, 35 c.m.$^3$ did not yield any matt varnish; with 40 c.m.$^3$ of benzene I obtained films more or less dull. But if one uses toluol with 30-35 c.m.$^3$ of it to 100 c.m.$^3$ of solution of sandarac 1÷9, one obtains a varnish which dries matt. The following formula repeatedly produced good results in the preparation of toluol matt varnish:—

| | |
|---|---|
| Ether ... ... ... ... | 100 c.m.$^3$ |
| Sandarac ... ... ... ... | 10 grammes |
| Toluol ... ... ... ... | 35-40 c.m.$^3$ |

Put the ether into a little bottle, and add 10 grammes powdered sandarac; if well shaken, the resin dissolves in a few minutes; then filter the solution through a folded filter, and mix the filtered matter with 35-40 c.m.$^3$ of toluol. Although one obtains a matt varnish with a smaller quantity of toluol, yet, nevertheless, it is advisable to add 25-40 c.m.$^3$ of it, as the layers become more equal, and wavy stripes are not so liable to arise. Pour the matt varnish on to the middle of the plate held horizontally; by tipping the plate gradually, one makes the varnish run into the corners, and, finally, run off the surplus at the corner by tipping the plate, not moving the plate on the level till after that. It is important to observe this procedure exactly, in order to obtain equal matt layers. It is not advisable to swing the plate at the beginning of the pouring on; it should not be done till the plate is vertical. The beginner requires pretty long practice before he succeeds in covering the plate with matt varnish uniformly. This matt film almost at once takes soft pencil (K1) very well and uniformly, and allows of the most varied retouching with stump or colour. The film shows relatively great resistance. The addition of some drops of absolute alcohol influences the formation of grain; if one adds more than thirty drops of alcohol to the above quantity, the shadows easily become wavy. A strong dilution with ether acts similarly. In the above formula, one may use 120 cm.$^3$ instead of 100 cm.$^3$ of ether for dissolving the sandarac, which produces a less covered matt varnish showing a more open grain; but in its total effect it differs little from concentrated varnish, but it permits less dabbling and rubbing with the damp hand ball. As to the current price of materials: Toluol matt varnish costs less than benzene matt varnish; 1 Kg benzene puriss. costs (in Austria) 2s. 6d. to 5s.; ordinary benzine, 1s. 8d. per kilogramme. At the same time, in regard to the cost, one must consider that, under the same conditions, less toluol than benzene is required as an addition to the solutions of

* From the *Photographische Correspondenz.*

sandarac. To all who have difficulty in producing benzene matt varnish, toluol matt varnish is to be warmly recommended for a trial. The addition of more than 40 cm.$^3$ of toluol would cause the separation of flaky resin. A correction might be made by the addition of an ether solution of sandarac. If one adds less than 35 cm.$^3$ of toluol, the matt films become too transparent and unequal. Finally, I would mention that toluol can be obtained of Herr Adlen, 10, Bezirk, Vienna. It has a specific gravity of 0·865 at 19° C. STYX.

## COLOUR.*

BY W. E. DEBENHAM.

There are various other methods, besides that of using several lanterns, of combining the effect of various colours. A very usual lecture experiment is to revolve a disc at such a rate that its various parts appear homogeneous. The disc is divided into sectors, variable in size, and each of some distinctive colour. Thus, if blue, red, and green occupy the proper proportionate spaces, and the disc is revolved whilst a bright light is turned on in front of a dark background, the effect is to produce white. Helmholtz also gives the following method. Lay two discs of the colours to be combined upon a horizontal surface. Then hold a glass plate vertically, so that the reflected image of one disc appears to cover the other disc looked at directly through the glass. This method gives us the opportunity of increasing the effective power of one or other colour according to the greater or less angle at which the plate of glass is observed. The discs should be laid on a dark or black surface; if surrounded by white, they look dark and dingy. Another method which I propose to show to-night, and which has the convenience of demonstrating composition of colour by a single lantern, is to have the colours in alternate stripes, and show them in the lantern first as the two colours distinct, and then, by throwing the image very much out of focus, allow them to blend.

If the lens cannot be sufficiently thrown out of focus for complete blending, a piece of white card or paper can be held so near the lantern as to intercept the rays, and be so completely out of focus as to ensure blending. The grating of red and green now shown in the lantern gives a sharp image on the screen, but by moving the lens, or holding a piece of card on the screen and advancing it to the lens, the lines of the grating disappear, and are substituted by a general yellow.

These methods depend upon the colours to be combined falling upon the same part of the retina. I find, however, that it suffices to allow them to fall upon corresponding portions of the retina of the two eyes. The frames now handed round contain a film of green in the opening for one eye, and of red in the opening for the other eye. If a light be looked at through these spectacles, it will not be seen of the colour of either film, but as a yellow—a greenish yellow. If there were as convenient a way of modifying the illumination to either eye as there is of lowering the light in one of a pair of lanterns, it might be so arranged that the yellow should not be found to incline either to the green or to the red. In another set of these spectacles, I have made the film for one eye red, and for the other eye it is divided. The lower half is of the same green as before, and the upper half of a bluish green. On looking at a light through the red and blue-green it appears white; but a slight shifting, so as to bring the other green into use, gives yellow.

Blue and yellow have been called primary colours, and by mixing these in transparent pigments a good green may be compounded. They do not, however, give green, but white, when their effect is produced simultaneously on the eye. This will be seen by allowing the blue and yellow discs now in the lanterns to overlap on the screen; also by looking at a light through the blue and yellow spectacles shown, and in other ways.

White, which, generally speaking, is a compound of all the colours, may be produced to the eye by compounding two colours, and any two colours which compounded produce the effect of white, are said to be complementary to each other. Starting from the red end of the spectrum, we may take any colour from that to a yellowish green, and we shall find another colour in the spectrum towards the violet which, compounded with the first, will give the effect of white. These whites are to the eye indistinguishable from one another and from ordinary white light, but may be recognised by analysis with the prism, or by holding coloured screens instead of white paper in the path of light. Thus, in the white compounded of greenish blue and red, violet loses its brightness, whilst red comes off badly in the white composed of violet and yellowish green. Green, not inclined to yellow or blue, requires a colour not to be found in the spectrum for its complementary, viz., purple, a compound of violet and red.

If we consider what colours appear to be related and what opposed, we find that a circle may be arranged, commencing with the spectrum violet and going through the series to red, which may be made not quite to close the circle, but may be blended into the violet by purple. In fact, the red and violet, although at the opposite ends of the spectrum, do not strike the eye as being the most opposed in character, nor do they act as complementaries to each other. In the colour circle now shown, I don't think anyone unacquainted with the spectrum would select the place between the violet and red as the starting point in particular any more than that, say, between the yellow and red or the yellow and green.

This approximation in visual character of the two ends of the spectrum, and most contrasted in wave-length and in physical characteristics, may be due to the fact that the violet is approximating in the wave-length to half that of the red, and, in rapidity, double. A little beyond the violet of the visible spectrum this simple proportion holds good. Now, as each colour sensation acts not only at a definite point, but over a considerable portion of the spectrum—recognising wave-lengths, that is, that are anywhere near its maximum of sensitiveness—it seems possible that, as we approach the relation of double rapidity such as exists in the musical octave, that sensation nearest to that of double rapidity may be excited to some extent, and thus the relationship of violet and red as approximating to one another, instead of striking us as the most opposed, may be accounted for. On the other hand, the fact must be remembered that the vibration of actual half wave-length of red is invisible.

The slide next thrown on the screen illustrates the essential difference between combinations of colour sensations, such as have been shown, and combinations of coloured films or pigments. In the first case we have proceeded by additions of sensation; in the present case we proceed by subtraction. In this slide three discs of

* Concluded from page 339.

yellow, violet, and greenish blue respectively overlap, all three at the centre, and in twos for a space along each side. Here, where the blue-green and yellow overlap, we have full green, the yellow and violet transmit red, and the violet and blue-green give blue. In the centre, where all three overlap, is darkness. The explanation is that the violet and yellow films are both transparent to red, the violet and blue-green to the blue, and the blue-green and yellow to the full green. Where all three overlap, as the third film obstructs the particular light passing through the other two, we have darkness. A mixture of pigments is somewhat similar. Here each pigment absorbs some of the rays that would be allowed to pass by another pigment, and the result to the eye is what is left after the absorption by the constituent pigments. With transparent pigments, therefore, of complementary colours we obtain black. A very good water-colour black may be obtained by mixing lake, gamboge, and transparent blue.

The different effect of colours seen, as blended by their separate effects on the eye, and blended by being mixed, may be illustrated by making a small stipple of blue and yellow, compared with a wash of a mixture of the same colours. In the latter case the effect is green; in the former, when looked at at such a distance that the separate dots are no longer noticed, the effect is that of a low white or grey.

The three colour sensations existing in most eyes are not, in all cases, complete. There are some persons who appear to be deficient either of a green or red sensation, and who are, therefore, to a great extent, colour-blind. The sort of vision of colours experienced by the green colour-blind can be approximately understood by holding this sheet of coloured stripes—coloured red, yellow, green, blue, and violet—in the light shown by two lanterns, one of which is furnished with a blue or violet-blue disc, and the other with a red disc. Here the green strip appears almost black, and the other colours somewhat different from what they appear in a white light. The position of the person who is red colour-blind may be estimated by holding the colour strips in a light compounded of green and blue. Here the red is black; the general effect rather inclined to monotony. It has been stated that as many as four per cent. of males are colour-blind. The proportion of females is considerably less.

---

Royal Institution.—Dr. A. C. Mackenzie, principal of the Royal Academy of Music, will on Thursday next (May 21st) begin a course of four lectures on "The Orchestra considered in connection with the Development of the Overture"; and Professor A. H. Church, Professor of Chemistry in the Royal Academy of Arts, will on Saturday (May 30th) begin a course of three lectures on "The Scientific Study of Decorative Colour."

Photographs in Colour.—The newspaper reports which a few months back gave such sanguine accounts of M. Lippmann's experiments, and which told an expectant world, for about the hundredth time, that the art of taking photographs in natural colours had been accomplished, laboured under a mistake; but the error has been the means of calling attention to the undoubted fact that certain photo-mechanical processes can produce pictures in colour which it is extremely difficult to distinguish from the original water-colour drawings from which they are copied. Oil pictures can be reproduced with nearly the same success, and it is not too much to suppose that these new methods will supplant the chromo-lithograph and the oleograph. Those who are interested in knowing what can be done in this direction should pay a visit to the parent society's rooms at 50, Great Russell Street, Bloomsbury, where numerous specimens of photographs in colour are now on view, including examples of the process to which we called attention in our last issue.

## ART IN RELATION TO PHOTOGRAPHY.

As we stated last week, Mr. Valentine Blanchard's promised course of lectures on the above subject commenced on Wednesday. Mr. Blanchard began a most interesting discourse by apologising for the necessarily elementary nature of much which he would have to say. Commencing with straight lines, and building them up into squares, cubes, circles, &c., he showed how more perfect forms were arrived at in the pyramid and the parallelogram, and how such forms benefited by being seen in perspective, and still more improved by the breaking of these straight lines, and the rubbing down of corners, as illustrated in stone work exposed to the action of the weather.

He pointed out that the various methods adopted by painters during the past four hundred years had developed certain art canons. Some of these may have grown rusty and lose their force, while new notions will often make a stir for a time, and threaten to displace the older rules. Painters work under such different conditions to photographers in having the power of selection and arrangement of the objects represented, that it might be argued that the latter, handicapped as they are by the limitations of the camera, can have no use for art canons. But the photographer cannot but benefit by studying the rules which guide the painter in his work, and must gain by such studies in educating his eye and powers of observation. But there must be *capacity* to see. It is a power which a man cannot purchase with his apparatus, and this is the reason why hundreds of amateur workers employ the camera who never produce artistic results.

Mr. Blanchard then pointed out, by numerous architectural examples, shown by the lantern, how primitive man developed, from mere wooden structures, stone buildings, in which the features of the wooden erection—the beams, supporting piers, and joints—were idealised. From such materials the Doric order was evolved, and this in turn gave place to more ornate forms, of which the Corinthian Capital—the origin of which tradition ascribed to an accident—was a good example. From these beginnings gradually grew the Greek temple, and later the architectural monuments which still remain to us. The Gothic nave was probably suggested by tree trunks with their branches intertwining overhead—so art comes from nature; and nature never being formal, pictorial art should avoid all appearance of formality.

Mr. Blanchard then proved, by numerous examples, how the occupation of the centre of a picture by the principal object resulted in weakness of composition, and contrasted a photograph of a church in which the fault was glaringly apparent, with one of the same building taken from another point. He closed his lecture by giving various examples of the pyramidal, wedge form of composition, and angular perspective, taking care to point out how balance can be secured by the introduction of objects in the right place. He advised his hearers to visit the National Gallery in order that they might study the originals from which many of his examples had been copied, and many other pictures to which he directed their attention. He also paid a tribute to the works of certain photographers who, in the old days, had produced pictures which, with all the modern conveniences of dry plates, it would be very hard to beat. Mr. H. P. Robinson's "Fading Away" was one of these. Mr. Blanchard very happily lightened his remarks by many a little reminiscence of those with whom he had been associated.

## DR. J. M. EDER'S CRITICAL EXAMINATION OF SCHIENDL'S "HISTORY OF PHOTOGRAPHY."*

BY C. SCHIENDL.

THE journals that I mention are no longer by me, but I can take Dr. von Monckhoven as a guarantee, for he, in his "Traité Général de Photography" (1856), and more explicitly in his "Historique du Procédé au Charbon," quotes this fact, and writes that Mungo Ponton, in the above quoted pages, makes the remark: "*Le bichromate de potasse est plus facilement reduit par la lumière en présence de matières organiques, et principalement de la gelatine, que s'il est seul* . . . ." (Bichromate of potass is more easily reduced by light in the presence of organic substances, especially gelatine, than it is alone . . .).

In the first years after Ponton's above-mentioned first publication (see PHOTO. NEWS, May 1st, p. 331), he alone repeatedly accentuates the fact of the sensitiveness to light of chromated gelatine; till much later the discovery was practically converted into money by another, through whom it became universally known; so that one can, or, rather, must acknowledge Mungo Ponton as the discoverer not only of the sensitiveness to light of chromates with organic substances in general, but also of gelatine specially for photographic processes. Eder's reproach, which has its sole support in Ponton's first publication, that my "historical delineations" are to be regarded only as castles in the air, as well as his disapproving phrase in reference to this, rest on a total ignorance of the facts, or possibly on an intentional perversion.

On page 151, Herr Eder writes: "We will, however, give a warning against some other stumbling-blocks to historical fact in Schiendl's 'History.' I note, especially, the following statement on page 58 of Schiendl's 'History': 'Farther, Legray gives the application of albumenised instead of salted paper—a discovery which, later on, Fox Talbot endeavoured to claim.' The author credits Le Gray with the discovery of albumenised paper, and dates it as June, 1850. This statement of the discovery of a printing process of so much importance to photography is also incorrect, for, earlier than that, Blanquart Evrard employed albumenised paper for positive printing, and described its properties in a communication to the French Academy of Sciences at a meeting held on May 27th, 1850."

The quotations concerning this discovery involve a complete distortion of my assertions, as well as an unjust statement on his part, for, firstly, I have not represented Legray as the discoverer of albumenised paper, but only mentioned that he also recommends the application of albumen in his "Traité"; and if the critic had read through my "History" with more conscientiousness and less animosity, he would have found that three pages previously (page 55) I expressly quote as follows:—"Blanquart Everard, therefore, mentions in the year 1848 a method of overlaying paper with albumen which contains chloride salts, by which the positives gained considerably in depth of tone." Therefore, both Eder's remark respecting my statement, and his own so-called correction respecting the supposed first publication of the 27th of May, 1850, appear to be imaginary.

The said critic says further (page 151): "In a similar way, Schiendl misdates the publication of the application of hyposulphite of soda as a fixing agent. The author, on page 48, says that Herschel recommended this fixing salt in the year 1840, whereas, in fact, this discovery was made already in the year 1839 by Talbot, with whom he was recognised to be in frequent communication, and was communicated to the Paris Academy March 1st, 1839."

Here Herr Eder has not only set forth my statement wrongly, but has also betrayed a surprising ignorance of the actual discovery of soda as a means of fixing.

In my "History," page 48, it is literally: "Incomprehensibly, none of the said inventors thought of hyposulphite of soda as a means of fixing, which had been already recommended by Herschel in the year 1819 as a means of rendering soluble the silver haloids until Herschel in 1840 recommended it again."

The impartial reader, when comparing this quotation with the above statement of Eder, cannot mistake the malicious intention of this critic, for my wording has been falsely rendered, not only with reference to the first acquaintance, but has also been forcibly mutilated by the omission of the word "again." Besides this, one can see that his own so-called correction with reference to the date 1839 (which date he mentions twice, therefore no printer's error can be inferred) is unjustifiable and incorrect; and with such statements dares to describe *my* statements not only as erroneous, but as false, which word always contains the secondary idea of intentional deception. The unprejudiced reader may therefore judge from the above quotation from Eder's critique, and the wording of my statement, which of the two could be described as "false."

On page 152 he describes as false my manner of writing the name Legray, and asserts that it ought to be written Le Gray.

Concerning this, I refer to the manner of writing of most French journals and books. The Frenchman, Charles Fabre, also, in his great and hitherto unequalled "Traité Encyclopédique de Photographie," writes the name Legray in the manner that Herr Eder calls false. Further, I find in the letters of Frenchmen with whom I have been in correspondence, on account of my "History," the name Legray written after my manner; and after such authorities, I believe I have good ground for upholding my way of writing the name, against the in no way recognised authority of my critic; but, in either case, it is quite immaterial to the proper understanding of the meaning.

Next, Herr Eder declares my quotation of Legray's communication respecting the collodion process false, and writes:—1. "Schiendl tells us that Le Gray employed hydrofluoric acid; Le Gray, however, expressly said 'methylhydrofluoric ether.' 2. Herr Schiendl writes 'fluoride of potassium *or* sodium,' while it should be 'fluoride of potassium *and* sodium.' 3. Le Gray employed 'aceto-nitrate of silver,' and not 'silver nitrate,' as Schiendl tells us. 4. Le Gray only obtained his result with an exposure of *twenty* seconds, and not five seconds."

Finally, the said critic declares that I was not in possession of the original text of Legray's communication, and places against it another text, pointed out to him as the original text. To this statement, I reply that my quotation is the real original text. In a pamphlet which Legray issued in 1850 (I have it no longer by me, for all the works I used I have returned some months since; but I find in Monckhoven's "Traité de Photographie" (1856) a literal extract from the same pamphlet, and, as this author offers indisputable warranty for accuracy, I will here repeat his quotation literally. In the said pamphlet, which Dr. Eder has apparently never seen, or he would have reflected more maturely upon his "correction,"

* Continued from page 331.

stands the following publication, according to Monckhoven:—"Je viens de découvrir un procédé de photographie sur verre par l'éther fluorhydric et le fluorure de potassium, dissons dans l'alcohol à 40°, mêlés à l'éther sulphurique et saturé avec le collodion—je sensibilise ensuite avec aceto nitrate d'argent, et j'obtiens ainsi des épreuves dans la chambre noire en cinq secondes à l'ombie; je developpe l'image par une solution très faible de sulphate de fer. . . ."

As Herr Eder does not appear to be very conversant with the French language, I will give the literal translation in comparison with the quotation contained in my "History of Photography."

| From the Original Text, "Monckhoven." | The Quotation contained in my Work. |
|---|---|
| "I have just discovered a photographic method on glass, by means of hydrofluoric acid and fluoride of potassium in 40° alcohol, and saturated with sulphuric ether and collodion. I afterwards treat it with aceto-nitrate of silver, and obtain pictures with it in the camera in five seconds in the shade. I develop the picture with very weak solution of sulphate of iron." | "I have just discovered a process, by which I obtain photographic pictures on glass by means of hydrofluoric acid and fluoride of potassium mixed with sulphuric ether and collodion. Such a mixture poured upon glass I treat with nitrate of silver, and can obtain pictures with it in the camera in five seconds in the shade. I develop with weak solution of sulphate of iron." |

From the original text quoted above, and that placed opposite to it, there is abundant proof that the four mistakes that Dr. Eder pretends to have found out are based on perfectly wrong information on his side, for, first, Legray does *not* speak of methylhydrofluoric ether, but only of hydrofluoric acid. Herr Eder, in his imperfect knowledge of the French language, takes the term *éther fluorhydrique* (hydrofluoric ether) for a mixture of hydrofluoric acid and ether, whereas it means, in fact, hydrofluoric acid (gas). Of a methylhydrofluoric acid, which, again, Eder takes for a non-existing organic substance, I have found absolutely no mention, and if perhaps the photographer (not the chemist) Legray may have spoken of methylhydrofluoric ether here and there in one of his other essays, which very likely Herr Eder had possession of, it could only have been in reference to the fact that he had added some methylated spirit to it to make a better solution, as, in those days, the latter was generally considered the best means of solution; still, it was not a "non-existing organic substance," for which Professor Eder takes it, but only a simple mixture.

Second. It ought to be, as stated in my work, "fluoride of potassium *or* sodium." Legray mentions later that *instead of* fluoride of potassium, sodium may be used; therefore Eder's assertion that it ought to be fluoride of potassium and sodium is wrong, as it concerns only the formation of fluoride of silver.

Third. That Legray writes "aceto-nitrate of silver" proves, not as Dr. Eder believes, that he applied the double mixture aceto-nitrate of silver, but only silver nitrate mixed with the least quantity of acetic acid, which was then exclusively used, but with which nobody meant the double combination. I could, therefore, quietly pass over the word *acid* as quite irrevelant.

Fourth. Dr. Eder's information that Legray mentioned an exposure of twenty seconds, and not five, as I stated, is not a true statement, as is evident from the above text, authenticated by Monckhoven.

I am, therefore, in the agreeable position of being able to maintain all the "inaccuracies" (so-called by Herr Eder) that exist in the wording of my "History," and, on the other hand, of being able to put down Eder's statements as merely the result of his ignorance of facts, and to the determination on his part to prove unpardonable mistakes in my work.

*(To be continued.)*

## INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT VIENNA.*

The International Photographic Exhibition in Vienna, held in the Austrian Museum, was opened on the 4th inst. by the Grand Duchess Maria Theresa, in the presence of Prince Phillip of Coburg-Gotha, Sir Augustus Paget, the English Ambassador, and many other illustrious art patrons. The exhibition is an exceedingly interesting and artistic one, and among the exhibits may be found many masterpieces. The jury have been very strict in admitting only works taken directly from nature, so that out of four thousand sent in only six hundred were hung. The works of both amateurs and professionals were eligible, and we must, before mentioning individual works, call attention to the artistic excellence of the English photographs, which are undoubtedly the best, both as regards figure studies and landscapes.

Among the honorary exhibitors are the Princess of Wales, the Archduchess Maria Theresa, and Duke Ferdinand of Toscana. The photographs of the Princess of Wales are instantaneous. Two schools of photography are represented, the "old" and the "new," or impressionist school. In the former the desired result is attained by attention to detail; in the latter, the pictures are worked so as to get an artistic and picturesque effect—just the same difference as is to be found in the paintings of to-day and those of some years ago. Some of the new school photographers even work with a pin-hole camera (without objective), as Alfred Maskell; others, like Lionel Clark, touch up their pictures to such a degree that they appear half paintings and half photographs.

Foremost among the impressionists is George Davison, and it must be confessed that both his landscapes and figure pictures make a truly artistic impression. When they are compared with those of J. Gale, who works in the spirit of the old school, one can only say that all roads lead to Rome.

Masterpieces are the animal studies of Gambier Bolton; his young dachshund, his lion, and his tiger are portrayed in a manner which catches their peculiarities to perfection.

There are many charming flower studies, and among the best those of Henry Stevens and Robert von Stockert. The artistic value of the photographs of Harry Tolley, Lyddell Sawyer, and H. P. Robinson is world-renowned, just as the Alpine photos of Vittorio Stella are valued by all lovers of mountain scenery. The exhibition deserves the warmest patronage of the public, and will, without doubt, find it.

Photographic Club.—Subject for May 20th, "Hand-Camera Possibilities"; May 27th, "Cameras and Dark Slides." Bank Holiday outing at Gomshall (Surrey); train from Charing Cross at 9.28, London Bridge, 9.35; does not call at Cannon Street.

* Translated from the *Neue Freie Presse*.

## Notes.

The gentleman who writes the "London letter" for the *Philadelphia Times* has lately taken for his subject the craze which at this time possesses English ladies with regard to photography—not amateur photography, be it understood, but the madness which they have for being photographed by the professional portrait taker. If all be true which is written by this correspondent, the photographers of London must long ago have enriched themselves beyond the dreams of avarice. Many "smart" women in London spend, we are informed, a fourth of their pin-money on photography, with the necessary consequence that the photographic business has increased enormously; indeed, the lucky English photographer "is now regarded as necessary to the well-being of fashionable English society as the baker, the bootmaker, and the dressmaker."

We learn that it is the custom to have each child photographed on its birthday, and that, even a few days after birth, babies are photographed (in buff), and a copy of the portrait is pasted in the family Bible. Ladies are photographed in their different new gowns, and the pictures, touched up with colour, are kept in an album on the dressing table. The owner has then merely to indicate to her maid the number of the picture representing the dress which she wishes to wear, and she is adorned accordingly. At all family gatherings, from weddings to funerals, the photographer is present. He photographs the wedding breakfast at the moment when papa is wishing success to the happy pair, the bride as she leaves the house for her honeymoon, &c., &c. In some houses the whole of the rooms are panelled with family portraits, and every corner, every table, and every bookcase is laden with them. If half of this golden dream should be believed in by our friends across the water, there will soon be a steady stream of needy photographers setting in towards our own shores in the hope of sharing the spoil.

The unfortunate individual who is just now in trouble through his alleged discovery of the philosopher's stone, seems to have carried us back in thought several centuries —to a time when men of all conditions beggared themselves in their search after the same will-o'-the-wisp. The extreme simplicity which so often accompanies the highest inventive genius is well exhibited in the case before us. The new alchemist had, it seems, in his possesion a mass of gold equivalent in value to twenty pounds sterling, and he claims the power of being able, by a metallurgical operation, to increase it three-fold. Now, a simple calculation will show that beginning with that sum, and operating upon it seven several times, its value would be increased to £43,740. The simple minded man did not think of this, but actually asked another person for a smaller sum in order to continue his investigations. If he had been content to avail himself of his own enormous resources, the present trouble would not have come to him.

In a most interesting paper on the sources and applications of borax, which was recently read before the Society of Arts, the author, Mr. E. L. Fleming, gave a most exhaustive account of this most useful salt, and many of those who will later on have an opportunity of reading the paper when published in the Society's journal will learn for the first time what an important agent in our manufactures is this same agent. It is used by goldsmiths, coppersmiths, ironworkers, safe makers, machinists, metallurgists, in the earthenware industries, in glass works, in the manufacture of cement, soap, colours, cosmetics, &c. Indeed, it is difficult to say where the uses of borax end. Of course, its value to photography was referred to, not only its employment in the toning bath, but also as a water varnish, and as a means of giving a gloss to collotype prints. Its use in the preliminary treatment of paper used for Woodburytype prints was also mentioned.

A government, we suppose, is nothing without its "rights"—or what it chooses to call its rights. A series of photographs of public buildings in India has recently been published by the Indian Government, with "a reservation of rights." Commenting on this fact, the *Hindu*, a native journal, remarks that it does not say much for the intelligence of the Government of India that such a restriction should have been allowed. There is nothing to preclude anyone from setting up his camera and obtaining a *fac simile* of the same object. "Having no rights, prescriptive or otherwise, in the original, we fail to see how a 'close preserve' could have arisen or be permitted in reference to objects accessible to all." So says the *Hindu*. This is all very well; still, government or no government, it is not pleasant to have your photographs copied without a by-your-leave, or with-your-leave. If the *Hindu* had ever gone in for photography it would have appreciated this fact.

We do not notice any attempt in the Academy of this year to depict the monsters of the deep. In 1889 Mr. Burne Jones essayed his celebrated mermaid, who was accompanied by a few finny companions more orthodox in shape. In 1890 Mr. Wyllie tried his hand at painting fishes in the deep sea. In 1891 no one is bold enough to make the experiment. Can this be due to the fact that M. Marey has photographed the medusa, the squid, the ray in all their undulations and curves? The instantaneous photographer, with his revelations as to how horses really walk, has more than once made the artist uncomfortable, and, now that he has tackled fishes, it is not surprising that painters have not dared to rival him.

It is satisfactory to note that public men are gradually getting to realise what is expected from them. Directly a man is talked about, the public want to see his portrait; but hitherto the experience of newspaper editors is, that either he has no photograph, or that if he has one it is about twenty years old. Therefore, we express our satisfaction that the Labour Commission, recognising their duty to society, have had themselves photographed in a group. It is only right that they should. Indeed, we do not see why there should not be a State photographer, whose function it should be to take the portraits of everybody who is "wanted."

The Société Photographique du Nord de la France has hit upon a decided novelty. It has opened a competition for the illustrating of a new humorous story, entitled "Le Mortier de Marc Aurèle." Members of all French photographic societies may compete by belonging for one year to the Société du Nord, and paying the fee for that period. French amateur photographers possibly have more invention and sprightliness than those in England. We are afraid that if an English Society were to seek to augment its revenue and its members by a similar plan, it would not meet with much success.

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

INSTANTANEOUS SHUTTER—A NEW DEVELOPER—PNEUMATIC SHUTTER AND PROPELLER—PHOTOGRAPHY IN COLOURS—ARTIFICIAL LIGHTS—MAGNESIUM LAMP—PLATES ON THIN GLASS—BIBLIOGRAPHY.

*Prize for an Instantaneous Shutter.*—At the meeting of the Society of Photography on May 1st, presided over by M. Janssen, it was announced that the Societé d'Encouragement have just founded a prize of 1,000 francs, to be given to the inventor of a shutter of more perfect type than any of those already existing. The conditions to be fulfilled are: rapidity of action, which ought to occupy about the one-fiftieth of a second or less. The time that it is quite open ought to equal half the time occupied by the action, or more if possible, the remainder being employed in opening and closing. The diameter of the entire opening ought to be equal to at least a tenth of the focal length of the objective with which the shutter is principally employed. The dimensions must be small, and appropriate to a travelling apparatus; the setting must be easily and readily brought about, the position optional, the times of exposure rapidly varied. If possible, the same shutter should be adaptable to lenses of different diameters. The prize, if won, will be awarded in 1892.

*Parmidophenol Developer.*—A paper on this subject has been presented in the names of Messrs. Lumière, jun.; the text will be published in the PHOTOGRAPHIC NEWS next week. We have made a trial of this developer, and have found it to be as stated, and it appears to us to exercise a very rapid action, much more so than either hydroquinone or eikonogen.

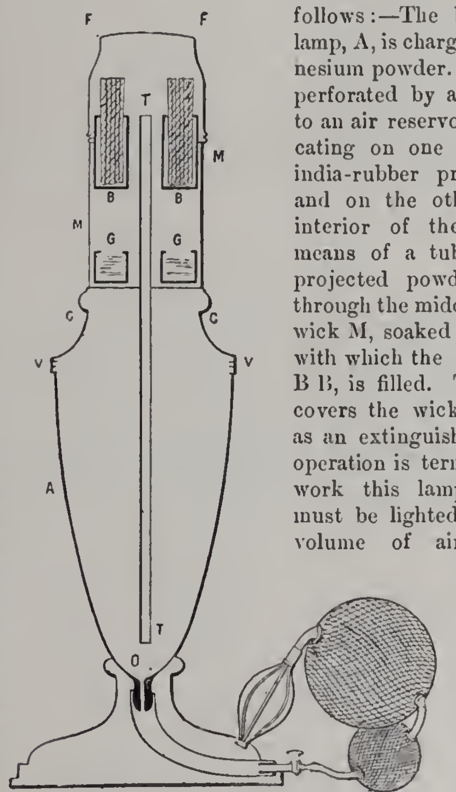
*Pneumatic Shutter and Propeller.*—M. Monti, the successor of M. Jonte, has brought forward a pneumatic shutter with a very simple action, worked by a metallic propeller which supplants the usual india-rubber ball. This propeller is formed of a little cylinder in which a piston works. It is sufficient to press the button of the piston in order to propel the air which works the shutter. M. Monti thinks that this modification will be advantageous in avoiding the wear inseparable from india-rubber bulbs. To perfect the apparatus, the india-rubber tube should be replaced by a material more durable.

*Magazine Camera by M. Lumière.*—This apparatus has been constructed by M. Monti from the designs of M. Louis Lumière. It is a sort of detective camera, carrying a great number of plates in little zinc frames. A simple movement—a pressure on a button—permits a new plate to replace that which has been exposed. This form of camera is compact, and in every way well designed.

*Photography in Colours.*—Following on the communications of M. Lippmann to the Academy of Science, M. de Saint-Florent—whose researches relative to photography in colours presented at that time a certain interest—has undertaken some renewed studies in another direction; little is at present known about the matter. His specimens sent to the Society of Photography have shown us nothing very interesting. One would describe the effect as solarisation produced by over-exposure, for the green bronze metallisation, which alone constitutes a colour, does not appear to be a reproduction of anything that would be green in nature. These proofs, obtained in a camera, required exposures of from eight to nine hours, attaining a result which is, for the time being at least, entirely useless. M. de Saint Florent promises a further report.

*Employment of Artificial Lights.*—M. Lande gives a description of the processes which he employs for photographing with magnesium light. He suspends to a thread of pyroxyline a little packet of flash powder—a mixture of magnesium and chlorate of potash—wrapped in paper and gun-cotton. Underneath there is another piece of thread attached to the other end of the packet, which is ignited by a match. M. Lande finds that great advantage is to be gained by this arrangement, and he shows, in support of his statement, a fairly large series of proofs, in general somewhat under-exposed, obtained by this means—principally figure subjects. The communication is, on the whole, only a *resumé* of the facts relative to this application which are already known, and does not set forth anything new.

*New Magnesium Lamp.*—M. Paul Nadar presented to the Society a magnesium lamp which he has had constructed, and of which the design is as follows:—The body of the lamp, A, is charged with magnesium powder. The foot is perforated by a tube joined to an air reservoir, communicating on one side with an india-rubber pressure bulb, and on the other with the interior of the lamp. By means of a tube T T, the projected powder is blown through the middle of a round wick M, soaked with alcohol, with which the annular cup, B B, is filled. The cap F F covers the wick, and serves as an extinguisher when the operation is terminated. To work this lamp, the wick must be lighted, and a large volume of air previously accumulated in the larger of the balls of the air-propelling apparatus. When the tap is once open, the air runs in a continuous stream, and all that is necessary is to replace that portion which has escaped by continually working the air-propeller. A dazzling flame springs up, and lasts till the magnesium is exhausted, and if it is necessary to have so long an exposure, the action can be maintained for two minutes. M. Nadar made experiments during the meeting with one or two lamps. One was able to take count of the great light thus produced, which permits not only posing, but also working with stopped down lenses, and even exposing a convenient time. The magnificent pictures, of a very large size, which were shown by M. Nadar, are proofs of the facts which he advances. They gained the admiration of the whole assembly, and M. Janssen addressed some well-merited compliments to M. Nadar. There is nothing



to hinder the execution of instantaneous pictures with this lamp. It is simply necessary to work as in broad daylight. This system is of great importance to photography of immovable objects (views of interior and post mortem portraits, &c.), and the employment of magnesium without chlorate puts any danger out of the question. The test of the strength of the light made at the "Conservatoire des Arts et Métiers" has yielded surprising results, surpassing, we believe, the power of 2,000 candles.

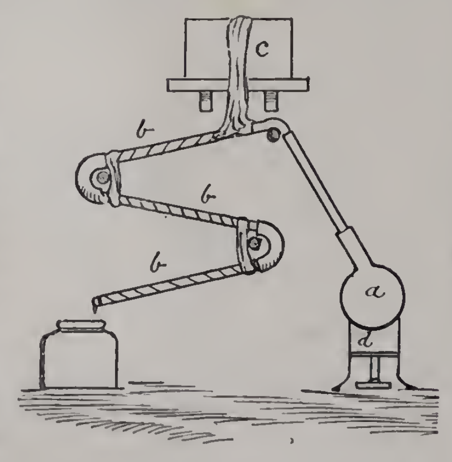
*Plates on Thin Glass.*—Messrs. Dehors and Deslandres are making bromide-gelatine plates on glass of $\frac{1}{30}$ of an inch in thickness. With these, double the number of plates, at least, can be packed in magazine cameras. The weight is diminished about two-thirds in the same number of plates.

*Bibliography.*—The Gauthier-Villars Library has just edited two very interesting numbers: first, "The Photography of Colours by M. Lippmann's Method," by M. Alphonse Berget, an *attaché* to M. Lippmann's laboratory; second, "Hydroquinone and Potash," by M. G. Balagny. Two new photographic journals have just seen the light of day; they are, first, the magnificent monthly *resumé* published by M. Paul Nadar, and already noticed in the Photographic News; secondly, *Heliochromy*, a monthly journal of photography, by M. Ed. Laussedaly, collographic printer, of Cloyes. This journal appears destined to uphold photo-collography in colours in opposition to chromo-lithography.

## A CHEAP STILL.

Mr. H. S. Haselgrove describes, in the *Journal of the Photographic Society of India*, an original form of apparatus for distilling water, which can be cheaply constructed by anyone in want of such a contrivance. We quote his description of it verbatim, leaving our readers to substitute for the Indian terms used their English equivalents:

"*a* is an earthen 'surahi' or goglet fitted with a cork, which has about six inches of glass tubing through it. *b b b* are glass tubes bound with about two thicknesses of linen; they rest at a slant on nails fixed in the wall; the bends are india-rubber tubing. *c* is a trough of water on a bracket, with a strip of cotton folded once or twice touching the bottom of the trough inside and the top of the upper glass pipe. *d* is a 'sigree' or stove. The cloth binding on the glass tubes should join near the elbows, and a small piece should hang near the receiver to let the cooling water drip outside of the bottle or receiver. If steam escapes uncondensed, another tube or two may be added. Without the 'sigree' my still costs less than one rupee."




## REPORT OF THE COMMITTEE ON STANDARDS.

It will be remembered that a Committee was appointed on March 11th, 1890, to consider the question of lens standards, and to report on the advisability of introducing other standards (such as for weights, measures, intensity of light, &c.) for use in photography. It was intended to continue the work carried out by the Society in 1881, but not to alter any of the standards then laid down.

The Committee consisted of the following gentlemen:—Capt. W. de W. Abney, C.B., R.E., F.R.S., A. Cowan, T. R. Dallmeyer, J. Sebastian Davis, W. E. Debenham, A. Haddon, H. Chapman Jones, Sir David Salomons, J. Spiller, W. Taylor, and L. Warnerke.

They have made a report so far as the extension of the lens standards of 1881 is concerned, and the Council have thought it advisable to publish the report without suggesting that it should be adopted by the Society. The question of standards will shortly be discussed at the Congress in Brussels, and it therefore seems premature to come to any definite decision until after the Congress has taken place.

The report of the Committee is as follows:—

### Object of the Council.

*March 11th*, 1890.—Capt. W. Abney, A. Cowan, T. S. Davis, W. E. Debenham, H. Chapman Jones, Sir David Salomons, J. Spiller, W. Taylor, L. Warnerke, T. R. Dallmeyer, and later on A. Haddon (president of the Lens Convention Committee), were appointed to consider whether any, and, if any, what explanatory additions should be appended to the report of the Committee of Standards for 1881, and to report on the question of standards in subjects not dealt with by that Committee.

The Committee held eight meetings, and the following questions were under discussion:—

### New Sizes for Lenses and Flanges.

1. In order to secure more universal acceptance of the Photographic Society's standards, the Committee entered into communication with the leading opticians, and invited members of the Convention Lens Committee to take an active part in the deliberation of this question. After an exhaustive examination of the subject, the Committee decided to recommend the addition to the existing sizes of flanges for lens screws 1 in., 1¼ in., 1¾ in., and 2¼ in. in diameter, with 24 threads to the inch; that no greater number of threads than 24 to the inch be used for photographic lenses and flanges of one inch and over; and that each flange or adapter shall have a mark indicating the top of the flange, so that when the lens is screwed home, the slot for diaphragms or the index of an iris diaphragm shall be uppermost. In addition to the indication of rapidity ratio of various diaphragms, the relation of focus to aperture was recommended to be marked on the diaphragms.

### Standard Sizes for Plates, etc.

2. In order to introduce uniformity in the sizes of plates and apparatus, the Committee recommend the adoption of standard sizes for plates, taking the existing half-plate, 6½ by 4¾, as the unit, and that smaller or larger sizes be produced by doubling or halving one dimension, so as to produce a series, 4¾ by 3¼, 6½ by 4¾, 9½ by 6½, 13 by 9½, 19 by 13, 26 by 19, &c., and a second series with a unit, 5½ by 4—namely, 4 by 2¾, 5½ by 4, 8 by 5½, 11 by 8, 16 by 11, 22 by 16; the optical lantern size to remain 3¼ by 3¼.

### Weights and Measures.

3. On the question of weights and measures, the Committee recommend that photographic formulæ be expressed in parts per thousand of the total volume, using parts by volume of liquids and parts by weight of solids. The units of weight and measure may be grammes and cubic centimetres per litre, or grain weights and grain volumes per 1,000 grain measures.

### Questions for Further Consideration.

Other questions which may require future careful consideration are the following:—

1. Uniform nomenclature of the photographic processes.
2. Unit of light for photographic purposes.
3. Determination of the actinic intensity of light.
4. Determination of the sensitiveness of photographic films.
5. Custom House formalities.
6. Copyright law.

---

## MESSRS. MORGAN AND KIDD'S WORKS, RICHMOND.

We lately had an opportunity of visiting these important works, the increasing business of which has necessitated extra accommodation, to be shortly again added to as soon as bricks and mortar can be put together on the large space of land which has been secured. Extended operations have also necessitated the use of the electric light, so that work shall no longer cease when daylight disappears. And it must be remembered that the light is not only required here for photographic operations proper, but is also wanted in the various studios where enlarged photographs are being finished in crayon, water or oil colours, as the case may be. The electric light installation is as thorough as it is efficient. The dynamo, worked by a large gas engine, stands in an out-house away from the main building. It is of the modern form known as the Kapp dynamo, a notable feature of which is the copper gauze brush, which emits no spark. From this out-house the cables are carried to the enlarging department, where the light is most required.

It may here be stated that the enlarging apparatus adopted by Messrs. Morgan and Kidd is of the simplest possible kind. A slanting mirror outside a square orifice in the wall deflects the daylight from the sky straight through the negative to be enlarged, without the interposition of any condensing lens. The objective, mounted in a simple form of camera, stands in the aperture, and the image formed by it is cast upon a vertical easel which slides to and fro on rails on the floor.

When it becomes necessary to supplant daylight by the less fickle electric lamp, the outside mirror is pushed away on a sliding bar, and the electric globe, pendant from a swing bracket above, takes its position outside the enlarging room aperture, while at the same time that aperture is filled in with a tissue paper screen to diffuse the light. The strength of the current is so regulated that the exposure required with this arrangement is just the same as with daylight. When the operator inside the room requires the light, he touches a switch at his elbow, and it is at his command. The switch is so covered that no visible spark can pass to the prejudice of any sensitive compounds which may be in the vicinity. We have, for the sake of clearness, spoken only of one enlarging apparatus, but it must be understood that there are several, each one having its electric lamp under the ready control of the operator.

As bromide paper owes its origin to Messrs. Morgan and Kidd, it seems only right and proper that they should still remain not only the largest manufacturers, but the greatest users of it. Here it is made, and it is possible to watch it from the moment when it leaves the coating machine to its exit from the building in the form of a handsomely framed work of art. But the bromide of silver emulsion is not only coated on to paper here; a big business is done in opal enlargements, and specially prepared canvas is also made for the reception of the photographic image as a basis for oil painting. The picture on the canvas is so much part and parcel of the ground preparation upon which it is produced that it is simply impossible to scratch up the one without the other. We mention this fact because we know that some artists have a prejudice against working over a photographic base, in the belief that it will eventually peel off. This accident with the canvas prepared by Messrs. Morgan and Kidd can never occur.

Each enlarging apparatus is separated by a curtain from its own developing room. We cannot call it a dark room, for there is abundance of light everywhere, but of course orange light of the right quality. Directly an opal or paper enlargement is exposed, it is placed in a tray with a glass bottom, and flooded with water. While it soaks for a moment, the operator mixes a few ounces of the good old ferrous oxalate developer—no other is used here, and fresh developer is used for every picture—and presently it is flowed over the wet print. In about one minute the image appears and rapidly gains strength, but should any part appear to hold back, possibly through some fault in the negative, a little stronger developer is applied locally, and the fault corrected. The picture now has a rinsing of very dilute acetic acid, and is immediately placed in the hypo bath. Everything is conducted with speed, for the secret of an effective bromide print is prompt development, and prompt everything. We also watched the development of a sheet containing twenty portraits, which had been exposed by contact in a machine devised for the purpose. Every one of these pictures was exactly like its neighbour; there was no variation whatever. At these works both large and small pictures are printed. At one time an order will come in for so many thousand copies from a single half-plate negative; while, on the other hand, the works have turned out a picture measuring 28ft. by 8ft. This was, of course, exposed and developed in sections, the main difficulty being in finding floor space upon which to arrange those sections and attach them to one another.

It would require far more space than we can afford to give a full account of this busy hive at Richmond. Paper, plates, and opals are coated here, the same being cut up, packed, and sent to all parts of the world. At the same time, the amount of all three actually consumed on the premises is enormous, and a large staff of artists, both ladies and gentlemen, is constantly occupied in giving the finishing touches to the pictures produced. The pictures are then mounted and framed in any style desired, the whole of the work being executed on the premises. The firm anticipate that their output of bromide paper will be doubled when the contemplated additions to their premises are completed, for these additions comprise a new paper-coating machine of enormous size.

---

## MR. PENNELL'S ANSWER TO THE DISCUSSION ON "PHOTOGRAPHY AS A HINDRANCE AND A HELP TO ART."

Through the kindness of the editor of the *Camera Club Journal*, I am able to answer some of the very severe charges and assertions made against my paper and myself at the Annual Conference. In appearing again before the members of the Camera Club, I have no intention of arming myself with a tomahawk and a scalping knife, as a speaker suggested, but I hope I carry much more powerful weapons. Although Mr. Maskell and, I believe, some other members were afforded the opportunity of completely annihilating me, I think, considering their opportunities, that they were extremely unsuccessful. Mr. Maskell began by charging me with ignorance "of the great advance in photography, artistically considered, which has taken place within the last two or three years," and nearly every other speaker backed him up in this. It has been my misfortune to have to attend professionally every show which could by any means be construed into an artistic one during the last two or three years, and I am, perhaps, more familiar with photography than the gentlemen who discussed my paper may have imagined. I certainly do not see that the work of any of the gentlemen Mr. Maskell mentions is painter-like, for the simple reason that painters do not produce their work by means of a machine. The subject may be painter-like—the execution is mechanical—photography affords persons with artistic sensibilities the means of carrying out, to a certain extent, their impressions, but it does not make them artists, nor is their work produced in an artistic manner, and work not produced in an artistic manner does not rank among the fine arts. Having both etched and photographed, I know very well the cost of materials in each case. An entire etching outfit, including plates, could be bought for probably the fifth of the price of a good lens. As to the six artists and the six cameras, to explain my point would require a considerable amount of space and time, and Mr. Maskell completely failed to understand my meaning. If Mr. Maskell will show me a photograph in colour, and one with its tones and values right, I shall be deeply indebted to him, and at once relinquish my art and take up photography. He also says that my photographs of cathedrals were bad. This is rather a serious charge to make, especially when I tell him that they were the best transcripts of the buildings which could be obtained. I did suppose that every photographer knew that it is impossible to photograph any great building which is in the least foreshortened, and render the perspective truly. If he would give me a true perspective rendering of a subject which I should suggest to him at Westminister Abbey, it would save me much time and drudgery.

Mr. Davison has impressed upon me that one can photograph any building provided one can get far enough away from it. Of course one can, but by getting away one loses one's wished-for point of view—and picture—and the greater proportion of impressive views of large subjects are beyond the powers of any photographer to render correctly.

I never said that a photograph would look altogether wrong if turned into a drawing; but I do say that it would require much correction, and I should be very happy to prove this to Mr. Maskell.

Mr. Debenham remarked that until twenty or thirty years ago, the regular mode of representing horses in motion was very much that of a rocking-horse. I had a faint idea that the Elgin marbles were produced more than thirty years ago, to give merely one example which Mr. Muybridge has quoted as a very striking one of the correct rendering of motion. And I repeat that the greatest artists merely owe to Mr. Muybridge the sincerest thanks for showing them scientifically, for the first time, facts which Mr. Muybridge himself has admitted have been known since the days of the cave-dwellers.

Mr. King made a most unfortunate assertion. He said he had supplied me with photographs which I had used in Westminister Abbey. It is quite true that he did sell me some photographs of the Abbey, but for my purpose they were quite worthless, as he will see when my article appears. I was not able to turn his photographs into drawings.

To Mr. Davison I would say that if I gave to the Conference the idea that I never used photographs, it was because I did not make myself understood. I often am obliged to use them, but always hate it, as it is much more trouble either to copy, trace, or enlarge a photograph, than it is to work from nature. They are often, however, I agree with Mr. Linley Sambourne, of great value, as I said in my paper. I cannot possibly have made the ridiculous statement that the brush or camera, the machinery used, need not be considered. The painter's tools are everything to him, and the photographer tries to make a machine equal them, and does not succeed. When art becomes as popular as stock-brokering or horse-racing, people will cease to sneer at it—and more than one great English artist has suffered from the sneers of his fellow-countrymen. If Mr. Davison does not understand what "selection" means, I can only refer him to any elementary work on the fine arts. I think Mr. Hamerton explains it very well in his "Etching and Etchers." It is the art of leaving out, selecting, and arranging—something which photography never can do. If Mr. Davison will show me a photograph in which the details and general effect are better rendered than in the Van Eyck in the National Gallery, I should be very glad to see it. I have seen the flowers shown at the Club, and I was not overpowered by the rendering of detail. Mr. Alfred Parsons could express it much better, and Mr. Francis James would have rendered the same flowers vastly more artistically. One may be perfectly ignorant of the use of photographic appliances, and yet, if photographs are artistic, they, the prints, must be governed by the same laws as any other art work; and hence an artist is much better qualified to judge of their artistic value than any photographer, unless the photographer is a skilled practitioner of the fine arts.

Major Nott, whom I must thank for reading my paper, was good enough to make some very plain statements as to my ignorance of photography, and the modern French school of art. This may or may not be; certainly Major Nott's assertions do not prove it.

Mr. Blanchard spoke of Winckle's "Book of Cathedrals," and compared unfavourably with Cassell's. I never heard of Winckle's book, but the only difference between Britton's and Cassell's is that the greater part of the work in the former was done with the camera-lucida, and the latter from photographs. The best work, however, in Cassell's—that by Mr. George Seymour and by Mr. C. E. Mallows—was not done by the camera at all, but drawings were made from points from which no photographs ever could have been taken.

As to Mr. Welford's conclusion that I have tried photography and failed, he is altogether mistaken. I have had more successes than failures. I turn to my "earlier writings" and I discover this sentence: "If the artists of to-day were not possessed of such external aids as photography, they would probably excel all old masters in sketching."

The President remarked that he thought photographic and artistic perspective were the same. I can assure him that they are not, and I should be glad to prove it. The expression I used, that turrets and towers which I saw were not rendered by a photograph, was very carelessly worded. What I meant was, that when standing at my full height I could see certain details which were hidden to the camera placed about a foot lower than my eyes: by stooping I could see other details which the camera, being fixed, could not take in. On moving three feet to the right I would get a vista which would not be taken by the lens; two feet to the left would shut out an unpicturesque object which would be the most prominent detail in the photograph. In fact, a good rendering of a cathedral is the most complete rendering, which may necessitate your taking half-a-dozen points of view, and working them all into one picture. (I don't mean in the photographic fashion.) When a photographer can do this, he will be much further advanced on the road to art than he is at present.

If there is any matter which I have not explained or made clear, I should be only too happy to do so. And I think that the members of the Camera Club must admit that I am not much the worse for my drubbing.

## Patent Intelligence.

### Applications for Letters Patent.

7,785. Bernard Krantz and Hermann Zeissler, 61, Chancery Lane, London, "Method of and Apparatus for Reproducing Photographs."—May 5th.

7,795. David Allan, 157, Whitfield Street, London, "The 'Champion' Metal Film Carrier."—May 5th.

7,876. Frederick William Cory and William Jones, 203, Old Christchurch Road, Bournemouth, "Improvements in Photographic Apparatus."—May 7th.

7,889. Thomas John Perry, 13, Temple Street, Birmingham, "Improvements in Photographic Developing Frames or Baths."—May 7th.

7,905. Wilhelm Hoffmann, 18, Buckingham Street, Strand, London, "An Improved Panorama Photographing Camera." —May 7th.

7,918. Arthur John Buncher and George Tucker, 6, Livery Street, Birmingham, "Improvements in Photographic Camera Shutters and Combined Means of Registering the Number of Exposures."—May 8th.

7,942. William Beyer, 5, Kelly Street, St. Pancras, London, "For Automatically Changing the Sensitive Plates Inside a Photographic Camera."—May 8th.

7,959. Etienne Jules Marey, 47, Lincoln's Inn Fields, London, "Improvements in Photographic Apparatus."—May 8th.

### Specifications Published

19,618. *December 6th*, 1889.—G. Bramley and G. Butterworth, Clay Cross, Derbyshire.

*Changing Boxes and Dark Slides.* Within a rectangular box, provided with sliding lids at the top and bottom, is an open reciprocating frame, which is slid by a push piece and returned by springs. The plates, which are dropped into the box with the film side upwards, are guided into the frame by guides at the sides and ends of the box, the bottom plate resting on ledges on the box and on the projecting end of a lever pivoted to the frame, and engaging at its other end with a pin on the box. When the frame is pushed forward, the end is withdrawn under the frame, with the result that the bottom plate, which has been pushed by the reciprocating frame off the ledges, now falls on the bottom lid and ledge of the box, and, when the frame returns, the end pushes it fully on to the bottom lid. The dark slide is adapted to slide in grooves in the bottom and top of the change box for receiving and returning the plates.

19,691. *December 7th*, 1889.—O. Freeworth, Lenkerbad, County Wallis, Switzerland.

*Cameras.*—The plates or films, held in frames which are connected together by tape, are stored in a compartment of the camera, and from thence pass over a prism, each side of which is the size of a frame, so that when a frame arrives at the front of the prism, it is in position to be exposed. To remove the exposed frame and bring forward the next, the prism is rotated by a knob from the outside. Sensitive paper may be also used, in which case a roller is substituted for the frames.

19,770. *December 9th*, 1889.—F. Miall, 13, Shelgate Road, Battersea Rise, Surrey.

Relates to carriers or sheaths for sensitised plates and films.

19,896. *December 10th*, 1889.—A. J. Boult, 323, High Holborn, Middlesex. (G. Eastman, Rochester, New York, U.S.A.)

Relates to apparatus for producing flexible photographic films.

*Coating Machines.*—The substrata, consisting of a solution of nitro-cellulose and camphor, &c., is distributed evenly on a plate or bed. The solution is contained in a hopper in connection with a traversing carriage actuated by endless chains. By suitable apparatus, consisting of an escape opening and a distributing blade, the solution is run out on the bed. The sensitised coating, consisting of a gelatino-argentic solution, is similarly put over the first.

*Drying.*—To dry the first and second coatings, an exhaust fan is used. The film may be also dried by exposure to the atmosphere, but this, besides rendering the atmosphere impure, has the further disadvantage that the evaporation products cannot be recovered as in the first drying system.

*Stripping-rolls.*—Rolls which may be mounted on the carriage, or on a separate carriage, are used to strip and roll the film off the bed. The film, which will be generally too wide, is divided into longitudinal strips by knives in connection with the carriage, a separate roll being used for each strip. The rolls are preferably mounted in different places, and are actuated by mechanism so that on attaching an end of the strip to the roll, it is automatically stripped off.

20,009. *December 12th*, 1889.—R. Haddan, 18, Buckingham Street, Strand, London. (C. A. Steinheil, Söhne, Munich, Germany.)

This invention relates to shutters and change-boxes in connection with cameras. At the back of the camera is pivoted a plate magazine, which moves within an enclosing case. The magazine has guides at both sides near the top to receive the lugs of the plate sheath. The plates are pressed towards the front for exposure by a spring at the back of the camera. To change the exposed plate, a lever partially ejects the sheath through an opening in the top of the magazine until lugs engage in angle hooks in the outer case.

19,897. *December 10th*, 1889.—A. J. Boult, 323, High Holborn, Middlesex. (G. Eastman, Rochester, New York, U.S.A.)

Relates to means for producing sensitised flexible films. The support, consisting of an alcoholic solution of nitro-cellulose and camphor, to which, preferably, some fusel oil and amyl-acetate are added, is poured on a flat plate which has been treated with wax. When dry, the surface is washed with silicate solution, and the sensitive emulsion applied.

19,926. *December 11th*, 1889.—"Magic Lanterns." H. Bond, 126, Wilderspool Road, Warrington, Lancashire.

This apparatus consists of two optical systems, side by side, lighted from the same lamp. The condensers and objectives are placed at right-angles, and the light is directed from one to the other by means of reflectors.

## Correspondence.

"CURIOUS PEOPLE."

Sir,—I was very much amused (in fact, I am always amused when an English editor takes up things American) by your remarks in the issue of April 17th, anent the *Saucy Chipmonk*, and reference to us as "curious people these Americans." Now it occurred to me that the editorial sanctum of the News must be plethoric of book lore, and why there was no work in which that well-knowu little animal the *chipmonk* was described seemed passing strange. I therefore consulted "Webster's International Dictionary," edition of 1890, and on page 249 I find as follows :—"*Chipmonk*, Indian name, *Zoöl.* A squirrel-like animal of the genus *Tamias*, sometimes called striped squirrel, chipping squirrel, ground squirrel, hackee. The common species in the United States is the *Tamias Striotus*."

These animals are comparatively common in the woods about here and in most parts of the U.S. Their habit of perching on a tree or a rock, and watching one's movements with their large, bright eyes ; their quick and erratic motions, now impudently peering out from one side of a branch, then from another, and in "the drop of a shutter," from a convenient rock, renders the adjective "saucy" most applicable. The poor and long-suffering amateur photographer, who has had all manner of opprobrious epithets heaped upon his unwilling head, should, I think, be spared this additional weight of woe in being styled a "saucy chipmonk." Trusting this may be of interest to you, and which you cau use if you see fit,

C. R. Pancoast,

*One of those "curious people."*

*Waterbury, Conn., U.S.A., May 1st.*

[The writer of the paragraph to which our goodnatured correspondent refers, tells us that by an oversight he omitted to append to it the immortal line, "This is a goak."]

THE QUAGGA.

Sir,—*Re* Mr. York's, or rather York and Son's, disclaimer. I have mentioned in previous letters that I was engaged by Mr. York to photograph in the Zoological Gardens, and in speaking of the camera as *my instrument*, I meant the instrument I was using. I certainly had no intention of laying claim to the particular build of camera or ownership of it, nor, as far as I can see, *have I misled your readers.* B. Harvey.

*March 30th*, 1891.

[Our correspondent's personal explanation is accompanied with a great deal of information about the quagga, interesting from the naturalist's point of view, but for which we have not space. We must now consider the correspondence closed.]

THE ETHER LIGHT.

Sir,—In your article on the ether light, page 301, you quote a correspondent as intimating that I was not the originator of either of the inventions claimed in my two patents. As a matter of fact, there is no record of anything that anticipates either of my claims. My first patent was not for a porous carburetter or saturator (such had been in use many years in other ways), but for the means for producing the blow-pipe flame (and lime-light), which consists in dividing the oxygen supply and passing a portion of it through a porous saturator, &c. That was strictly new. My second patent was applied for in October, 1887 (the date is printed on the patent specification), after the improvement had been in practical use for some months.

European writers frequently assume that the date of a U.S. patent is the date of first legal record of invention. This is a mistake. According to our patent laws, a patent may, under certain circumstances, be issued several years after the date of first legal record. My original photo-mechanical engraving process is often spoken of as if invented in 1881, although it has been recognised by the Patent Office as dating August 12th, 1878. My folding optical lantern was mentioned and illustrated in the Photographic News two years before it was patented. My process of composite heliochromy, patented in 1890, was on legal record in 1888. My patent attorney mentions a case in which the inventor did not even apply for a patent until more than seven years after date of first legal record of invention.

*Philadelphia, April 27th.* Fred. E. Ives.

## Proceedings of Societies.

The Photographic Society of Great Britain.

At the meeting of this Society held on the 12th inst., the chair was occupied by Mr. James Glaisher, F.R.S., president.

The paper on polychromatic impressions by photographic methods, announced for the evening, was read, in the absence of the author, by the assistant secretary. The walls of the room were hung with specimens of photomechanical productions in colours, sent for the occasion by Messrs. Angerer and Goeschl (3), Bouillod Valladon and Co. (7), Frisch (5), F. Hanfstangl (3), Löwy (12), Photographic Art Colour Company (3), Photochrome Company of Zurich (19), Rommel (8), Rouillé (6), and Wezel and Naumann (9). There was also an exhibit by the author of the paper, on a separate screen, of photographs by the Woodbury and collotype processes imposed upon paper on which colour had previously been printed.

In the course of the paper, the author said that he did not propose to go into the question of the probability of obtaining coloured photographic effects direct from the colours themselves. That was a question for the future. The recent investigations had not thrown much light upon the matter, and no practical or artistic effect of commercial value had been arrived at by them. He would refer to well-known methods, and only make use of such pigments as are readily procurable. He was at the outset much struck with the indifference of printers generally, both typographic and lithographic, to photographic methods. The few who did make use of photographic methods were rare, and he would endeavour to rouse others into entering upon the use of these methods, which he believed were neglected by printers from a mistaken impression that phototypy was a speciality presenting difficulties too serious for them to take it up. He would not go into the question of asking light to perform functions which it could not be readily made to perform, but would confine himself to what could be unquestionably and without difficulty achieved. Photo-chromotypic printing could be divided into two kinds. In the first kind, which might be called simple photo-chromotype, the photograph was in monochrome, and was printed upon a base on which colour had previously been printed by mechanical means ; stones or blocks having been prepared by the artist for the purpose of adding the colour where required. This was the method most in use and most commercially valuable. The second method, which he called composite photo-chromotype, depended upon the use of several negatives or plates, each of which had been taken so as to exclude the action of certain colours. These plates, when printed each in its proper coloured ink, on paper in proper register, gave an image in colour. This was the method employed particularly by Ducos du Hauron, and more recently by Ives, of Philadelphia. The latter was, indeed, still busy with investigations and experiments tending towards the perfection of the method. For composite photo-chromotypy, there were generally three plates prepared, one with yellow, one with red, and one with blue ; and, by using these in combination, some approximation to the colours of the original was obtained. It was, however, always necessary to retouch or to mask portions of the separate plates, and he protested against the claims sometimes made, that the colours of nature could be obtained by the selective action of three plates without touching by hand. The plates to be used must be orthochromatised, and that according to the colour required to be reproduced by each particular plate. For red it was useless to employ isochromatic or orthochromatic plates sensitised only to yellow and green. The means published by Wellington in the Photographic News in 1885 would answer very well.

Chlorophyll, methyl-violet, and cyanin sensitised for red ; but eosin and erythrosine did not. A set of photographs was then shown in the lantern, one of which represented a group of flowers in colours, and the others were the plates prepared, each to render certain of the colours contained in the original. Of the photo-mechanical methods most suitable for yielding these impressions, he recommended the collotype and the Woodbury process. If part of the printing was to be of a metallic character, then Woodburytype was better than collotype. An example of mixed colour and metallic printing was shown in the representation of a vase gilt in places. In conclusion, the author expressed his regret at not being able to be present to read his paper in person.

Mr. John Spiller, by way of opening the discussion, directed attention to the remarkable collection of specimens of coloured work hanging round the room. He referred particularly to some photogravures in colour by the successors to the firm of Goupil and Co., and to some exhibits by Hanfstangl, of Munich. He also noted with interest the opinion of the author of the paper with regard to the recent attempts to solve the problem of photography in natural colours, that we are still as far as ever from achieving that consummation.

Mr. Addenbrooke thought the subject one of great interest, and proposed that the discussion should be adjourned till the June meeting, when the members would have been able to read the paper. With regard to this proposal, it was ultimately announced that if, after the paper which stands for the June meeting and discussion thereon, there should be time for further discussion on the present subject, it might be continued on that occasion.

Mr. Valentine Blanchard said that one of the methods employed by Goupil was a method that was in use here as long ago as 1790. With regard to imposing a photograph upon a prepared coloured surface, that was invented in England by Woodbury, and the inventor was very angry at the use that had been made of it by Goupil, but had not succeeded in obtaining any satisfaction.

Dr. Eugene Albert, of Munich, a son of the late Joseph Albert, so well known in connection with collotype printing, showed specimens of a print in three colours, separately and with the conjoined effect, which was excellent, upon one paper. He addressed the meeting through an interpreter, and was understood to say that the specimens round the room were, only to a limited extent, photographic work, as the selection of certain parts of the plates for the several colours was in them made by touching or blocking-out by the artist. In the case of his own specimen, there was only photographic selection, the plates not being touched by hand. He further said that he had used all his endeavours to make the process as practical and cheap as possible, and, therefore, had used not collotypic methods, as his father had done, but typographic ones. He found that it was desirable to have the blocks of different kinds of grain for the different colours.

Mr. W. E. Debenham thought it remarkable that colour screens could be obtained selecting colours so purely as to dispense with the necessity for retouching or blocking-out by hand.

The President moved the thanks of the meeting to M. Vidal for his paper, and to Dr. Albert for his specimen and remarks. He also thanked the various exhibitors for sending the pictures that appeared on the walls, and the assistant secretary for the getting together of such an interesting collection. With the exception of one set, the specimens would remain upon the walls until the end of June.

Dr. L. S. Bruce, Mr. H. Holiday, and Mr. C. E. Pearce were elected members of the Society.

### Camera Club.

*May 7th.*—Mr. F. Machell Smith in the chair.

Mr. Willis gave an address entitled "Clam-Chowder," which treated chiefly of the influence of temperature in developing platinotype prints, and some examples were shown. Amongst other illustrations were shown some excellent examples of platinotype prints upon wood for panels and decorative work. These have since been arranged upon a screen for exhibition at the Club.

In the discussion which followed, Messrs. Maskell, Cobb, Clark, Elder, Lambert, Davison, and the chairman took part.

On May 21st Dr. Acworth will read a paper treating of the flash-light.

### Holborn Camera Club.

Mr. Frederick Brocas presided at the meeting on Friday last, at the club room, 100, High Holborn, when Mr Arthur Lawton was elected a member of the Club.

Two representatives of the Autotype Company attended, and gave a practical demonstration on the autotype or carbon process. After giving an outline of the method of preparing the tissue, the demonstrator went on to speak of the printing, which he characterised as the only obstacle to overcome in the carbon process. The development of the picture was to a great extent under control, but it was quite as well to have a properly exposed print. For this purpose he showed three actinometers ; one, the simplest, acting by colouring a piece of silver paper to a standard tint. The other two were on a different principle, one having a numbered scale, and the other a scale of tiny negatives of varying densities. He then mounted some exposed prints, and developed them by placing in hot water and washing away the soluble gelatine in which the picture is buried. Development was then stopped by placing the print in cold water, and, after placing in a 5 per cent. solution of alum to thoroughly discharge the bichromate salt, it was thoroughly washed and hung up to dry. For negatives made in the ordinary manner, an additional operation becomes necessary ; for if the printed tissue were laid down at once on its final resting place the picture would be inverted. To remedy this the exposed tissue is laid down on a temporary support, such as a thick paper with a hard, highly-polished surface, from which it is finally transferred on to its intended support, such as an opal. The process is an extremely simple one, and recommends itself to all amateurs.

Twenty members attended the club outing to Pinner on Saturday, some eighty plates being exposed.

### Photographic Society of Ireland.

The last ordinary meeting of the session was held at 15, Dawson Street, Dublin, on Friday, 8th inst. (Mr. Geo. Mansfield, J.P., in the chair), when four medals were presented to Mr. John White for the best work in four classes of the Society's annual competition.

Mr. Alfred Werner then read a paper on "Platinum Printing." Having given his hearers a *resumé* of the history of the discovery of platinum and its subsequent conversion to the use of photographic printing, and the various researches of different workers, he proceeded to the chemistry of the subject, and said that platinum printing consisted in the fact that when iron, uranium, mercurial, and analagous compounds are exposed to light they suffer reduction to a lower state of oxidation. The salts found to be the most expedient, the cheapest, and of which there was a large selection, were those of iron, and with salts of that metal alone would he deal. He mentioned that Dr. Eder had, in his "New Researches on Sensitive Iron Salts," thoroughly investigated the sensitiveness of iron compounds, and gave the following list : Iron perchloride and oxalic acid, ferric oxalate, the double salts of amm., sod., pot., ferric oxalate, ferric tartrate, &c. In making a selection from these compounds for platinum printing, care should be taken not to use iron perchloride and oxalic acid, for the reason that HCl was formed. Ferric oxalate, the second on the list, could not well be crystallised, but a very concentrated solution could be prepared by dissolving freshly precipitated ferric hydrate in oxalic acid, according to the equation—

$$Fe_2\,(OH) + 3\,H_2C_2O_4 = Fe_2\,(C_2O_4) + 6\,H_2O.$$

He found that a solution prepared by simply mixing ferric sulphate with excess of oxalic acid (1 part $Fe_2\,(SO_4) + 3\,H_2C_2O_4$) gave a solution which undoubtedly contained ferric oxalate, and answered the purpose just as well. Having explained how to prepare ferric oxalate, Mr. Werner went on to tell his hearers how to prepare some of the platinum compounds generally used, and said that platinum compounds were more easily reduced when in the platinous state, and might mention that, as in the iron, there were two distiuct classes of platinum salts, distinguished as the "ic" and the "ous." In the platinic and in the ferric state platinum acted as a tetrad, fixing four atoms of any monad elemeut ; in the platinous and ferrous these metals acted as diads, fixing two atoms of monad elements. The chemistry of platinum printing admitted of rather easy explanation ; they required a platinum compound and an organic body, one of irou being nsually employed, as before stated. Ferric oxalate, when exposed to light in solution, or in preseuce of orgauic matter, underwent reduction ; $CO_2$ gas is evolved, and ferrous oxalate resulted. It was ferrons oxalate which reduced platinnm, while ferric oxalate did not. Ferrous oxalate was practically insolnble in water, bnt was easily soluble in oxalate solntion, and at the moment of its solution it re-acted with the platinum salt, reduciug it to metallic platinum in a very fiue state of division. The lecturer said that there was no donbt the chemistry of platinum printing had not been thoroughly investigated, and that, recognising that fact, his brother and himself had instituted researches, and expected to be in position shortly to pnblish their views on the subject. What actnally took place was uudoubtedly the decomposition of a molecule of water, the oxygen liberated converting the ferrous iron into ferric.

Mr. Werner then gave a full practical demonstration of platinum printing by both hot and cold bath processes, and also showed, as the result of his own investigation, a platinum replacemeut process, in which albumen and chloride silver prints were totally replaced by platinnm ; also a printing-ont platinnm process which had not yet been brought to perfection.

### Brixton and Clapham Camera Club.

At a meeting on May 7th, Mr. T. J. W. Bartrop gave a lectnre entitled "A Tour in the Ardennes," illustrated by some eighty or ninety lantern slides taken with a hand-camera by the lecturer and his party on a trip last August.

On the 9th inst. the first onting of the season took place to Perivale. The day was dull and the scenery poor, but some good views were obtained of the chnrch and rectory. There are a few pictures to be had along the canal.

The next meeting will be held on the 21st inst., when a lectnre will be given on "Hand-Camera Work" by Mr. W. H. Powell.

### North Middlesex Photographic Society.

Notwithstanding the clondy weather, a fair number of the members attended the field-day arranged for Satnrday, May 9th, to Highgate and district, satisfactory work being done.

On Monday, May 11th, Mr. J. W. Marchant in the chair, a demonstration on the "Working of Platinotype Paper," was given by a member. Prints from the frames were passed ronnd for inspection, showing the depth of printing necessary, and were then developed. The bath was kept at about 75°, and in some instances where shadows were a trifle heavy, the dark portions were withdrawn from the developer while the lighter portions were allowed to gather strength.

On Monday, May 5th, a demonstration on the "Working of Kallitype Paper" will be given by Mr. F. W. Cox, when visitors will be welcome.

### Richmond Camera Club.

At a special general meeting of the Richmond Amateur Photographic Society on Friday, the 8th inst., Mr. Cembrano in the chair, it was resolved that the Society should be called "The Richmond Camera Club," and the alterations in the rules consequent ou the change were made.

At the ordiuary meeting which followed, the Chairman opened discnssion on the snbject of "Fixing and Washing Gelatine Negatives," and recommended the use of two separate fixing baths in the case of valuable negatives.

Mr. Ardaseer explained the chemical changes in fixing, and insisted on the importance of leaving the plate in the fixing bath a sufficient time for the insoluble bromide that was left in the film to be converted into the soluble form, which could be washed out.

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

Stamps.—*Adhesive Material for Postage Stamp Portraits.* You cannot do better than employ the same material that is used for the Post Office wrappers and stamps, viz., light brown dextrine, or "British gum," dissolved in cold water. By itself this is apt to dry a little too hard in warm weather, so a small proportion of glycerine is generally added ; but you must be sparing in the use of such ingredient, for fear of the moisture affecting the permanence of the photographs.

L. T. D.—"*Royal Academy Pictures.*" Messrs. Cassell and Co. announce three parts, as last year, the first of which appeared on Friday, the 8th inst. Be sure and get it at once, for it is a good shilling's-worth, and they were soon out of print last time, or went np to a fabnlons price. Do not wait to get all three parts together, or you may be disappointed. *Black and White* also renders a good acconnt of the Royal Academy pictnres.

W. P.—*The Forge.* We agree with yon that the frontispiece of the April *Bulletin Belge* is highly suggestive of "The Smithy," by Mr. Adam Diston, of Fife, issued many years ago. The make-up of the picture is not ideutical, but the pose is very similar, and must necessarily be so.

S. B. S. (Nottingham).—*Cleaning off Old Negatives.* You can do better than simply saving the glass for greenhonse purposes. There is a small quantity of silver to be economised, and this can be got off by soaking the glasses, whether varnished or not, in warm washing soda. Leave them in for a few hours, and then rub them with a tuft of tow tied upon the end of a stick of firewood. The films are loosened, mnch of the gelatine dissolves, but all the silver settles as a precipitate worth collecting and putting into the general residnes. Prolonged immersion etches the surface, but soaking for a whole day does not sensibly affect the glasses.

Nemo.—*Hydrogen-Chlorine Photometer.* The idea may be a good one, but there is always a danger of hydrogen and chlorine exploding in bright snnlight, although you may have taken precautions to preveut snch a result. A better plan would be to use bromine water, and determine by volnmetrical testing the amount of hydrobromic acid formed, or free bromine remaining, at the end of a day's exposnre by standard solutiou of hypo with addition of starch paste. See British Association report of Leeds meeting, page 263, for experimental details.

A. M. S.—*Business for Sale.* Your lease appears to be short, and yon do not say what prospect there may be of getting an extension granted. Consnlt Mr. H. J. Beasley, of 65, Chancery Lane, who may be able to assist you in finding a purchaser.

R. B.—*Chromotypic Specimens.* M. Léon Vidal's paper was read on Tnesday, and an exceedingly interesting collection of coloured work, illnstrative of rcceut processes, remains on view during the present month.

J. Murphy.—*Non-Actinic Varnish.* Aurine cake dissolved in methylated spirit forms a good yellow non-actinic varnish, or gamboge dissolved in methylated ether and filtered. Apply with a brnsh to the parts which yon wish protected. Skies are more often painted ont with Bates's black varnish, or a comuion shellac varnish thickened with lamp-black.

Metallic.—*Reduction of Silver by Iron.* We fail to see wherein your method possesses any advantage over the common process of rednction by zinc. The chloride of zinc is so easily washed away, bnt iron rnsts, and is apt to contaminate the rednced metal.

Old Amateur and D. G. P. received.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1707.—*May* 22, 1891.


CONTENTS.



## SUGGESTED BY SOME RECENT EXHIBITIONS.
### No. I.

BY H. P. ROBINSON.

The lessons of the past should have a beneficial effect on the performances of the future, and it may be profitable to consider one or two points that have become prominent in some of our more recent shows, that we may perchance attain another step or two in the direction of what we all desire—perfection.

It may be said at once that the Liverpool was the largest, finest, and best managed exhibition of photographs ever held in England, and I think I may add the world. It is probable that no other town has such fine rooms available for the purpose, and the management was beyond all praise. The energy of the president and secretary was so tremendous, that the one has been likened to a tornado, and the other to a hurricane, but the simile is not perfect, for storms are always capricious, and often destructive; the work of Mr. Lange and Mr. Mayne was well-regulated and all for good. The expenditure was wisely lavish, the "side-shows" most admirable, and only one of the numerous lecturers failed to make his appearance, and his place was easily filled. The lantern lectures and exhibitions have probably never been equalled, and were so eagerly sought after that the doors were besieged like those of a popular London theatre on a first night, and the entertainments had to be worked like Richardson's show, one down, another come on. The afternoon musical arrangements were well thought on, and good, and the festivities—for it was a festive time—began with a dinner, and concluded with a dance; nor should the unofficial gaieties be forgotten. The result was that 55,000 people were induced to pass the turnstiles to look at photographs, and with all the expenditure, there is a considerable balance of profit to the good.

Could anything be more satisfactory or apparently less open to criticism? Yet there are one or two things that I humbly think may possibly be improved in the future for the benefit of the art as an art, if not for the good of the gate money, and I know my Liverpool friends will forgive me for mentioning them, and will attribute all to a desire for a nearer approach to what they all wish, which is to produce a still more perfect model show than ever in their next triennial venture.

The leading idea of the managers of the Liverpool exhibition is reform—which there can be no doubt is much needed in exhibitions—and to elevate the standard of public competitions in every way. The first principle they have adopted is that every picture exhibited should be *new*, or never exhibited before, within certain well-defined limitations. This is well intended and plausible in theory, but it does not work out well in practice. The clause in the conditions relating to this matter is as follows: "Except in the champion class, no picture of any description shall be entered or allowed to compete which has been previously exhibited at any public competition in the United Kingdom, an exception being made in favour of the Photographic Society of Great Britain as regards its 1890 exhibition." This clause, at one fell swoop, disqualified all the best work that had been exhibited during the previous autumn and winter, except for the champion class. To show what was disqualified, it is only necessary to mention the Cornwall Polytechnic (the pioneer of prize giving shows, and an important one to which the leading exhibitors always contribute) and the Edinburgh. Thus the Liverpool public were deprived of seeing much of the good work of the year; but the clause has the still more objectionable disadvantages of inducing the feeling in the prize takers that they only obtained their medals after most of the best had been disqualified.

Let us enquire as to what was the effect in the general appearance of the exhibition.

I think it will be admitted that the first function of an exhibition should not be that of a competition at all. To me it seems that the object should be to show the people of the district in which it is held how the art has advanced since the last exhibition; to show the perfections of this marvel of our century; to convince the public that there is something more in it than they see in street show-cases; and if photographers can be encouraged at the same time, so much the better. As things go at present, when the amateur thinks more of the number than of the honourable distinction of his medals, it seems necessary to attract work by offering numerous rewards; but it cannot be said to be encouraging photography to disqualify most of the best work—work that the local world would gladly see—and reward only the best of what was left.

Another inevitable result of competition, especially in classes, is, that the appearance of the rooms must be seriously damaged. When competitors are invited to send their work, it must, to be just, be hung equally well, good and bad together, when it is well known that the best effect is produced, as at exhibitions of paintings, by placing the best pictures in the best places. Moreover, it is much more difficult to reject in these cases, as rejections must be done by the committee instead of the judges.

We will now see how these remarks apply.

What was the great attraction at the Liverpool Exhibition, apart from the unexpected Italian pictures, of which more anon? Was it the classes, numerous as they were, with the regulation four from each exhibitor, *all of them new?* Certainly not—except, perhaps, to the contributors. It was the grand gallery containing the champion classes and pictures sent not for competition. Thus, the exhibition was greatly redeemed from failure as a show by the very pictures which the rules went far towards excluding—those that were not new. That so many contributions were sent to this department is a healthy sign that when photographers have anything good to exhibit, they will contribute without the stimulus of an expected medal, for most of the exhibitors must have sent without any hope of winning one of the two medals allotted to this large class. I must not be mistaken to mean by this that photographers are wrong in competing for medals when they are offered, or that the best results of the year should be disqualified by the fact of its having been successful at some distant exhibition.

The Liverpool system spreading, as it has done, to other societies, has had a different effect to that intended. It was certainly meant to encourage photography, but the mistake was in supposing that the *new* was better than the *best*.

What is expected of an exhibition, either in town or country, is, as I have indicated, to show the best work that has been recently produced, and I have no hesitation in saying that a good deal of the best work done since the last exhibition did not appear at Liverpool, its absence being due simply to the fact that it had been exhibited before at remote exhibitions, where a very small fraction indeed of the 55,000 visitors would have had a chance of seeing it. And if, as I believe was at first contemplated, the enthusiasm for the *new* had included the Pall Mall pictures in the "ban," or, to use the modern word, the "boycott," I fear the exhibition, with the exception of the champion and not for competition classes, would have been confined chiefly to local amateurs and foreign exhibitors.

The rule also acts badly in another way. I admit that a true photographer will always try to do his best, but he will probably not go to any extra trouble or expense in his endeavours to show how far the art can be carried, if his work may be admitted to only one exhibition, except to be shelved in the champion class, which, after all, was only invented as a decent method of burying obnoxiously good work.

When a great work in any art appears, it would be much better to upset the obnoxious thing by capping it with better work, than to knock it out of time by disqualifying it because somebody else has seen it. This would be progress indeed. It would be quite easy to encourage less successful work in some other manner than by clearing off the best out of the way by a time rule, or a previously-exhibited clause.

I have written very frankly on this subject, partly because the exhibition was so vast a success as to be able to bear criticism without damage, and also because I know it is the sincere wish of its very capable managers to make the next—as this has been with all its faults—"the greatest show on earth" connected with our art.

The Gloucester exhibition was also a great success, but, of course, in a smaller way. There was only one gallery, well lighted, but the effect of the room was greatly spoilt by the arrangement in classes. This is inevitable as long as classes exist, and it seems there must be classes as long as it is necessary to offer a large quantity of medals to attract all sorts and conditions of exhibitors. The model exhibition will be the one that offers no medals, or only a few for the very best works, as at the Photographic Society of Great Britain, and rigidly excludes bad or indifferent work—a Utopian state of things that cannot occur at present, for the exhibition that rejected bad and doubtful photographs would be but sparsely filled; and how long would an exhibition holding society exist that rejected most of the work of its members, as it certainly must do if good work only was accepted? The Photographic Society of Great Britain takes the liberty of rejecting timidly the very obviously dreadful, and, to some extent, the obviously commercial, and sometimes loses members thereby; but I don't think that there were many rejections at Liverpool and Gloucester, and certainly much bad work was hung.

In a future article I hope to continue this subject, and to extract a lesson or two from the mistakes of the past.

---

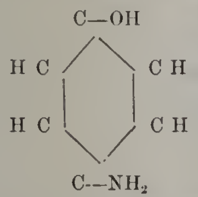
Photographic Club.—Subject for May 27th, "Cameras and Dark Slides"; June 3rd, "Platinotype Possibilities." Saturday outing at Carshalton, May 23rd; train from London Bridge at 2.18; meet at Carshalton 3 to 3.15.

Yellow Prints.—A silver print which has turned yellow by time may be readily brought back to brilliancy and good colour by immersion in the following bath:—Saturated solution mercury bichloride in hydrochloric acid, 8 to 10 drops; distilled water, 500 grammes. As soon as a purple tone has been acquired the print should be removed and carefully washed, then dried and mounted. A warm tone may be obtained by subsequent immersion in chloride of gold and potassium, 1 gramme; distilled water, 125 grammes. This latter bath will keep, and may be used till exhausted.—*Anthony's Bulletin.*

## PARAMIDOPHENOL DEVELOPER.

BY AUGUSTE AND LOUIS LUMIERE.

THEORETICAL considerations have led us to test the paramidophenol developer, the constituents of which are, perhaps, best represented by the following diagram :—






In a recent note, Dr. Andressen, of Berlin, induced by the same considerations, stated that he had experimented in developing photographic pictures with phenylene-diamines and amidophenols.

The first (phenylene-diamines) are the subject of his German patent of the 1st of April, 1888, while the latter (amidophenols) are completely neglected, no doubt because they did not yield the results that he anticipated. Without previous knowledge of these experiments, we have found that paramidophenol, added to an alkaline carbonate, exhibits remarkable powers of reduction, which make it an excellent developer. The water of the developer becomes decomposed, the oxygen goes on to the paramidophenol to furnish quinonime, and the hydrogen reducing the bromide of silver, gives bromhydric acid, which works in its turn on the basis or carbonate alkali to produce a bromide. The paramidophenol can be prepared by reducing paranitrophenol by pure tin and hydrochloric acid $C_6H_4(OH)NO_2$ $(OH : NO_2 = 1 : 4)$ or the dinitrophenol $(C_6H_4)(OH)(NO_2)_2$. It forms very thin crystals, which fuse at 184°, while decomposing at 200°; it is soluble in 90 parts of water, and in 22 parts of pure alcohol. The solubility increases a little with the temperature.

The aqueous solution oxidises in the air, especially in the presence of the carbonate, and takes a purplish-red colour, but the addition of sulphite of soda prevents these alterations. The following formulæ appear convenient to us for the developing of bromide of silver gelatine plates.

| | |
|---|---|
| Water ... | 1,000 |
| Sulphite of soda | 200 |
| Carbonate of soda | 100 |
| Paramidophenol | 12 |

Or still better—

| | |
|---|---|
| Water ... | 1,000 |
| Sulphite of soda | 200 |
| Carbonate of lithia | 12 |
| Paramidophenol | 12 |

The first formula gives a very energetic developer, and is especially convenient in the development of instantaneous photographs. The paramidophenol, which acts as a developer, presents the inconvenience of not being very soluble, so that it is not possible to modify the composition of the developer as in the case of pyrogallic acid.

Hydroquinone and eikonogen have, however, this same inconvenience in an equally high degree, and the paramidophenol has the advantage over these latter, especially the hydroquinone, of never discolouring the gelatine. The solution will last a very long time, even in open-mouthed bottles, and negatives developed with old solution never present that yellow tint that is frequently to be remarked when other developers are used. The deterioration of the developer is very slow, so much so that in 100 grams of solution six or seven plates 13 by 18 can be developed without there being the least appreciable difference between the first and the last. Paramidophenol is expensive, but principally because there are not at present many uses for it, and also because the processes for purifying this agent have not been studied. The substance which is met with commercially under the name of paramidophenol is often very impure; but there is no doubt that on the attention of chemists being directed to its photographic value, this substance will be more easily produced in a state of purity, while, at the same time, its cost will be diminished.

## PHOTOGRAPHIC ANALYSIS OF MOVEMENT.

IN a former article we pointed out the various improvements which had been introduced by M. Marey in his prosecution of this fascinating study, and in what manner he had perfected the work which was first seriously taken up by Muybridge, of California. We also showed that in the portrayal of any quickly moving object, when several exposures in each second were desirable, certain conditions were necessary to success. The Eastman film, upon which the successive images are received, must perforce travel along as well as the moving object itself, but, unlike that object, it must be brought to a brief standstill at the moment that the image is impressed upon it. This difficulty was only surmounted with great trouble, and the apparatus used is necessarily of a somewhat complicated nature, and far more intricate than contrivances of the same kind which may be regarded as the pioneer machines of this class. It is true that the early machines were not used for photography, for they were devised at a time when the art was in its infancy so far as rapidity is concerned. We allude to those contrivances which, exactly the same in principle, were used for giving the appearance of moving figures on the lantern screen.

These were of various forms, and they had fanciful names, but they all depended for their effect upon that curious property of the eye known as persistence of vision, by which the image of anything seen remains, or *persists*, on the retina for about the eighth part of a second. The first of these was Plateau's device, consisting of a wheel perforated with radial apertures, on the back of which figures were painted, which figures, when the spectator twirled the apparatus round in front of a mirror and looked through the apertures, appeared to move.

Plateau's instrument was arranged for use with the oxy-hydrogen light by Duboscq, but the apparatus was extremely complicated. In the zoetrope we have again Plateau's device in another form, the wheel being changed for a cylinder, the upper part of which is pierced with the necessary apertures, and the painted or printed devices placed inside. One advantage of this modification is that the mirror is dispensed with, and another that the figures, printed on slips of paper, can be varied and changed at will. By means of mirrors and a lens, the effect can be projected on a screen, but the loss of light is great. The phenakistiscope was another modification of the same principle, by which the moving figures could be better seen when projected on the lantern screen. This, too, gave place to Beale's choreutoscope, which may be regarded as the modern development of those which came before. This has appeared in two forms. In the first, transparent figures of the zoetrope kind were set in a disc which turned in the slide stage of an ordinary optical lantern; each figure coming to a brief rest, and being shut off by an interposing shutter before the next came into view. In the second, the instrument was modified so that it could be adapted readily to any existing lantern, and in this form it now appears in many dealers' catalogues. We have called attention to these instruments, most of which are obsolete, to show that what is now being done in the construction of apparatus for taking photographs at brief intervals of time is not quite so new in principle as many persons would be apt to think. Another purpose which we had in view was to render plain that one of these modern contrivances would, by the addition of a powerful light, represent a means by which the photographs it produced could be projected upon a screen. By this means, the original movements can be represented with astonishing fidelity to nature, but, of course, in practice a separate instrument would be adapted to the purpose.

Referring once more to Prof. Marey's apparatus, we may point out that the sensitive film is contained on bobbins — or rather reels — which have at each end a broad flange, which is sufficient to protect the edges of the sensitive band from access of light. But another protection is also provided which actually enables the operator to transfer the bobbins to and from the apparatus in full daylight. Each strip of film has fastened to it at one end a band of black paper, and at the other end a similar band of red paper. The red end is first wound on the reel, so that when the winding is complete the outer surface is black. But when a band has been unwound and exposed in the apparatus, and re-wound upon the receiving reel, the red end comes into view and protects the film from light on its new reel. This arrangement not only secures the film from light access, but also shows at a glance the difference between a bobbin which has already been exposed, and one which has not yet been used.

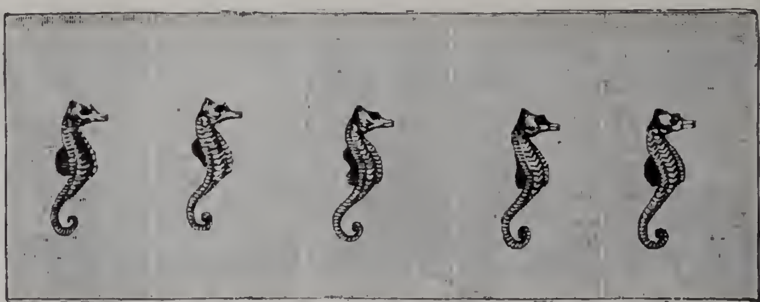


Fig. 1.—Successive Images of a Sea Horse. 20 images per second.

Fig. 2.—Successive Images of a Gull in Flight. 25 images per second.

We have already stated that the instrument has been used by Prof. Marey in studying the movements of animals of minute size, as well as those of larger dimensions. Nor are his studies confined to those which tread the earth, for the inhabitants of the water, as well as those which fly through the air, have been made to bow to his will.

The apparatus has been used by Prof. Marey in studying the movements of various creatures which can be kept in a marine aquarium. In this case, the aquarium is set in a window, and is shielded in such a way that no light can enter the apartment except through the water. Opposite to it is placed the photographic apparatus. In this way the pretty, umbrella-shaped medusa, or jelly fish, has been photographed. Another object which has been submitted to similar scrutiny is the sea-horse, which is able to propel itself through the water by a movement of the dorsal fin so quick that the eye cannot follow it. By securing twenty images per second of this creature, it is shown that these movements are undulatory in character, and that they are from below upwards. An engraving from some of these photographs is appended.

Still more interesting are the photographs which have been secured by aid of this machine of birds in flight. Those who have studied aeronautical science have long ago come to the conclusion that if man is ever destined to conquer the air, in the same sense that he has long ago conquered the water and the land in journeying over both at marvellous speed, it will not be by the agency of the unmanageable balloon. He must rather look to nature for his model of a flying machine, and must study the methods by which birds are enabled to fly. The problem is possibly one which will never be solved, but there are many sanguine persons who believe otherwise. But we may all agree that the study of flight, although it may not lead to the inauguration of a new method of human progression, is full of fascination. Such a study, too, may reasonably be considered as a help to artists, who, from time immemorial, have pictured a bird in the air in a manner as stereotyped as the zig-zag form which they gave to lightning until photography taught them better. This form may be at once expressed by the letter V, and it would not be so positively wrong if it were varied sometimes by being inverted thus Λ, for it stands to reason that in flight a bird must as often place its wings in the downward position as in the upward. This is recognised by those close students of nature, the Japanese artists, who frequently draw flying birds with their wings depressed. The annexed illustration, which is taken from one of Prof. Marey's photographs of a gull in flight, shows not only the two positions referred to, but also a number of intermediate ones. Such a series of different positions ought to be of great use to artists who are in the habit of introducing flying birds into their seascapes.

---

Photographic Society of Great Britain.—Technical meeting May 26th; subject for discussion, "Influence of Development on Gradation." June 9th, ordinary meeting; paper on "A New Sensitometer," by Mr. Leon Warnerke, and adjourned discussion on Mons. Vidal's paper.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

AGAR-AGAR IN EMULSION-MAKING—STRIPPING NEGATIVES—HIGHLY SENSITIVE COLLODION EMULSION—POSITIVES IN BRONZE.

*Agar-Agar as a Substitute for Gelatine in Emulsion Work.*—I notice that a patent has been granted in Germany to Mr. Wassily Rebikow for the use of agar-agar in emulsion-making. The idea of employing this article as a substitute for gelatine—it has long been used for culinary purposes—in photography is by no means a new one. About fifteen years ago the suggestion was made to employ the material in the collotype process, and at that time I myself conducted some experiments with it with a view to see how it would answer as a vehicle for the salts of silver in the negative process, chiefly for dry plates, in place of gelatine. The results of my experiments were, however, not encouraging. In the first place, the agar-agar proved to be exceedingly difficult to dissolve, even in boiling water; then I found that it decomposed the silver salts exceedingly fast in the dark, so that a carefully washed plate did not even keep well until it was dry. In fixing such plates after development with an acetic acid pyro developer, the iodo-bromide of silver film was scarcely to be removed by the aid of any of the well-known fixing agents. Even cyanide of potassium and a hot concentrated solution of hypo were but partly successful in dissolving out the haloid salts from the envelope of agar-agar by which they were surrounded. Finally, I was never able to cover a plate, even if heated, uniformly with agar-agar solution, on account of its sudden setting. Even if an almost boiling solution of the material was employed, I did not obtain a perfectly even layer. Mr. Rebikow suggests the use of very weak (from one-fourth to two per cent.) solutions, and he recommends two methods to remove the muddiness which results in dissolving the material, and which, if it remained, would lead to fog. In order to make emulsions with agar-agar, he proposes to treat it at first in the dark with a weak solution of chlorine or of bromine, then to wash it out in several changes of water. For bromide emulsions it is preferable to bromise the agar-agar, whilst for chloride emulsions it should be chlorised. After this treatment the agar-agar solution is filtered through flannel, when it is said to be ready for the production of sensitive emulsions by any of the well-known processes. Considering the above-mentioned difficulties arising by the employment of agar-agar solutions, it seems to be doubtful whether the patented process offers any advantage over the use of gelatine solutions in emulsion-making.

*Stripping the Films of Gelatine Negatives.*—The following method is recommended by Mr. Jaffé, editor of *Die Photographie*:—The negative, which should have been taken on a gelatine plate specially prepared for being stripped, is coated after drying with a fifteen per cent. solution of gum arabic, and the solution is allowed to drain until but a small quantity of it remains on the plate. A gelatine film, corresponding in size to the negative to be stripped, is then taken and placed for a short time between sheets of moistened blotting-paper. The film is then laid on the prepared surface of the negative and pressed against it, commencing at one edge of it and gradually giving way. In the case of large negatives, a second person should be present to facilitate the manipulation.

*Highly Sensitive Collodion Emulsion.*—A collodion emulsion equal in sensitiveness to gelatino-bromide emulsion has undoubtedly been a desideratum. It seems that our experimentalists have at last succeeded in its accomplishment, and that the good old collodion will be raised to honours again. It will be remembered that Dr. E. Albert, of Munich, introduced a highly sensitive collodion emulsion a few years ago, which commercially is in two separate solutions, the one consisting of the ordinary collodio-bromide emulsion, the other of eoside of silver, the addition of which increases the sensitiveness of the emulsion forty times. It is now announced by the *Photo. Mittheilungen* that Dr. E. Vogel has succeeded in preparing a highly sensitive emulsion by emulsifying the blue sensitive gelatino-bromide in collodion, and that plates coated with it may be manipulated in the same way and with the same ease as gelatino-bromide plates. Further particulars have been promised by the inventor as soon as the process has been tried theoretically and practically in all directions. We await the results of the experiments with interest.

*The Production of Positives in Bronze.*—In Liesegang's *Photo. Almanach*, M. Eugen von Gothard describes a process to produce positives in bronze, which he has learned from M. F. Veress, of Klausenburg, the well-known experimenter in heliochromy. Such positives may be produced on various supports, such as glass, metal ferrotype plates, &c. The sensitive compound is made as follows:—

| | | |
|---|---|---|
| Distilled water ... ... ... ... | 100 | c.c. |
| Cane sugar ... ... ... ... | 2 | grammes |
| Glucose ... ... ... ... ... | 5 | ,, |
| Gum-arabic (powdered) ... ... ... | 5 | ,, |
| Honey ... ... ... ... ... | 1 | gramme |

After the ingredients have all dissolved, 10 c.c. of a saturated solution of bichromate of ammonia are added to the mixture. It is allowed to stand for some hours, and then carefully filtered from two to three times. With this solution the plates are coated. It is important to obtain an entirely uniform layer, and to prevent dust, or other impurities, coming in contact with the solution and with the prepared plates. It will be better to dry the plates near the fire; after five to fifteen minutes they will be dry, and may then at once be used. They are exposed in the printing frame under a negative in diffused light. The time of exposure depends very much upon the moisture of the air. It is always a good plan to give at first a trial exposure—say of ten minutes. It is better to expose slightly too long than too short. Development is done with bronze powder; a tuft of cotton is charged with the powder and passed lightly over the surface of the plate. This manipulation, as well as the coating, may be effected in a room in weak daylight. As soon as the image has been fully developed, a second clean tuft of cotton is taken, and the surface of the plate brushed over with it until the bronze image begins to become bright, and the deepest shadows are entirely free from bronze powder. Splendid effects may be obtained if differently coloured powder is used in development. After the image has been completely developed, the film is coated with two per cent. collodion to which some glycerine has been added. The plate should then be exposed to sunlight; if it be a glass plate it is exposed from behind, through the glass. After from fifteen to twenty minutes the plate is washed in running water until the yellow colour has been removed and the water remains clear. After drying, the surface is varnished with diluted copal varnish, or with colourless zapon varnish in the case of the support being a metal plate; the glass plates, however, are coated with a dark brown or black varnish, and looked at from the glass side.

## REGISTRATION OF PARCELS BY INLAND POST.

The following changes in the system of compensation for inland parcels and inland registered letters have been made public by the Postmaster-General:—

On the 1st of June next the undermentioned changes will take place:—

1. In respect of the loss or damage of inland parcels for which a certificate of posting shall have been obtained, compensation up to £2, instead of up to £1, will be given without payment of any fee; but, as at present, compensation will not be given for any other unregistered inland postal packets.

2. The separate system of insurance will be merged in a general system of registration. No separate fees for insurance will be charged; but, on prepayment of a single fee (in which will be included the ordinary registration fee of 2d.) in addition to postage, any inland postal packet may be registered, and compensation in the event of loss or damage may be secured up to £25.

3. The fees payable on registering inland letters, parcels, and other postal packets, and the respective limits of compensation, will be as follows: Fee, 2d., limit of compensation, £5; 3d., £10; 4d., £15; 5d., £20; 6d., £25.

The general rules governing the inland registered letter post will apply to registered parcels; and those rules, as well as the rules for the inland parcel post, will remain unchanged, except as mentioned below:—

1. A system of payment in full for damage, whether to letters or to parcels, will in all cases be followed, instead of the present proportionate system.

2. Rural postmen will receive for registration any letter, parcel, post card, book-packet, newspaper, or sample packet, whether the fee be 2d. or more than 2d.

3. The registered parcel post will be available for watches and jewelry, which it has hitherto been necessary to exclude from compensation when sent by the parcels post. Unregistered parcels found to contain money, watches, or jewelry, or on the cover of which is written or impressed the word "Registered," or any other word or phrase to the like effect, or marked in such a way as to indicate special value, will be compulsorily registered, and charged on delivery with a fee of 8d., in addition to the ordinary postage; but compulsory registration will in no case give a title to compensation.

4. The hand-to-hand check, which gives to the registered letter system its security, will be strictly observed in the registered parcel post.

5. As in the case of all other registered articles, an official receipt will be taken on delivery of each registered parcel; and, by prepaying a further fee of 2d., the sender of a registered letter or parcel may obtain, in due course, an acknowledgment of delivery signed by the recipient.

The public are reminded that, as a necessary condition of compensation in any case, the contents of the letter or parcel must have been safely packed and enclosed in a reasonably strong cover, case, or wrapper, fastened securely, and in a manner calculated to preserve the contents from abstraction or damage in the post.

The sender of a letter or parcel intended to be registered must write on the cover, over the address, the word "Registered," and the amount of the fee proper to the value up to which he desires to secure compensation, thus—"Registered 2d.," "Registered 3d.," and so on.

This scheme applies only to the United Kingdom, the Channel Islands, and the Isle of Man, and not at present to letters or parcels addressed to places abroad.

Further particulars may be obtained at any post office.

By command of the Postmaster-General.

*General Post Office, May,* 1891.

## ALUMINIUM.*

BY JOSEPH W. RICHARDS.

The title of my lecture is, "The Aluminium Problem," and for the time being, taking these words as my text, we will first direct our attention to the word "aluminium," the metal of which our discourse treats. It may be interesting to begin by inquiring how this word should be spelled and pronounced. You all know that two ways of spelling it are in common use, both Webster and Worcester sanctioning either way, Webster giving *aluminum* as preferable, and Worcester *aluminium*. You have also observed that I use the longer spelling. Let us inquire into the history of this matter.

Sir Humphrey Davy was the first to give a name to the metallic basis of alumina, although it is not probable that he ever isolated the metal. He said in 1808, that if he had been successful in decomposing alumina and isolating the metal in it, he would have suggested for it the name *alumium*. Davy evidently intended this word to represent "the metal from alum," simply taking *alum*, and adding *ium* as the proper termination for a metal. Objections were at once made to this name—not to the termination *ium*, which was considered absolutely proper, but to the root or stem of the word. It was maintained both in France and Germany that the name of the new metal should be derived from its oxide, and not from such a complex salt as alum, of which it happened to be an ingredient. The French name for the oxide was *alumine*, so they formed, and have always used, *aluminium*. The German name for clay was *Thon*, and for alumina *Thonerde*, so Gilbert suggested, in his famous *Annalen*, to call the metal *Thonerde-metall*, or, for short, *Thon-metall*. Fortunately, none of the German writers adopted this suggestion, but most of them adopted *alumium*. I find one instance of the metal being called, in Sweden, *argillium*, from the French word for clay, *argille*.

Whether Davy recognised the justice of these criticisms, or whether he considered that *alumium* needed an extra consonant simply for euphony's sake, we find him, in 1812, making bad worse by spelling the name *aluminum*. It is probable that he felt that the French were correct, but was unwilling to conform entirely to their mode of spelling. However, the name first proposed by Davy had taken root in Germany, and in 1812 we find the English using *aluminum*, the French *aluminium*, and the Germans *alumium*. The French have always used *aluminium*. The Germans used *alumium* exclusively until 1824, when Wöhler, translating a paper of Berzelius from the Swedish, used *aluminium*, which he also used in his famous memoir describing the isolation of the metal, in 1827, and which has been used in Germany almost exclusively ever since.

As to the English, they used *aluminum* altogether until Wöhler's discovery, when the spelling favoured by Wöhler was almost universally accepted, *aluminum* being used only now and then by some patriotic Englishman averse to foreign innovations. We may say, therefore, that since 1827 the scientific world accepted and used the term *aluminium*.

Americans, however, have been most active in resurrecting the old English term *aluminum*. They say it is the shorter (true) and *ergo* the better way. That is what I should call intensely American. Mr. Eugene H. Cowles tells us that the Cowles Electric Smelting and Aluminum

* A portion of a lecture delivered before the Franklin Institute.

Company was originally organised as the Cowles Electric Smelting and Alumin(*i*)um Company, but that the writing of that extra *i*, and especially the dotting of it, became such an insufferable burden and expense that they went to the court about it, and had the name changed to the Cowles Electric Smelting and *Aluminum* Company.

The question now is, which of these two forms shall we use? If *aluminium* is positively too long for practical, every-day use, and must needs be shortened, it is mere trifling to say that the dropping of one *i*, the removal of one letter out of nine, is any satisfactory means of accomplishing that end. But if a shortening must be made, if manufacturers need it, and public opinion demands it—if, above all, it would, in any way, save dollars and cents, and lower the market price of the metal—then let us make a shortening which will be radical, which cannot be improved upon, and adopt Mr. Oberlin Smith's suggestion to call the metal *alium.* I think the suggestion a happy one, and if any change from *aluminium* should become necessary, I should be in favour of, and be one of the first to use, *alium.* There are two among the electrical processes I now discuss together: Cowles Brothers' and Hèroult's processes for producing aluminium alloys. The principle involved is the interruption of a powerful electric current, the formation of an immense arc, and the reduction in this arc of alumina, by carbon, in the presence of a metal. The working of both of these processes is too well known to require my tarrying to describe them to-night. In Cowles Brothers' furnace the current is interrupted by having to pass through a box filled with broken pieces of carbon, the whole interior is raised to a very high temperature, at which the alumina present is reduced by the carbon and alloys with the metal. That this is the *rationale* of the process there can be almost no question. The Hèroult apparatus is arranged differently. Alumina is fused by the electric arc, and, floating on molten copper, is then treated as though it were an electrolyte, a carbon rod dipping in the alumina being the positive pole and the copper the negative. The patentee of this process claims that it is essentially electrolytic, and, indeed, it may be allowed that some electrolytic action may take place, because the parts are arranged in just the correct way to obtain that result, but, by a quantitative study of the quantity of the electrical current and the amount of metal reduced, both in this furnace and in the Cowles process, it can be shown that several times as much aluminium is produced as the current could be able to separate electrolytically. It is, therefore, evident that the larger part of the reduction in these furnaces is due to some other agency than electrolytic action, and this other agency can only be the reducing action of carbon. Of the two furnaces, I think that the Hèroult is the better arranged, and in best shape for practical working.

From the preceding observations, we may, then, consider the fact established that *alumina can be reduced by carbon*, at a temperature somewhere not far above the fusing point of alumina, which is below 2,600° C. This opens up the possibility of simpler processes of reduction than any yet known. Is it because the alumina is fluid that carbon reduces it, or is it solely because of the high temperature? I cannot but think that the fluidity of the alumina plays an important part in this reduction. But, may it not be possible to render alumina fluid at a lower temperature than now appears necessary? I think that it may. For instance, when I dissolve iodine in alcohol, rubber in carbon bisulphide, do not these substances become fluid at ordinary temperatures? Cryolite and some other salts appear to dissolve alumina mechanically at about a red heat, and if this action be purely mechanical, then we certainly have alumina fluid at that heat. I think it quite probable that alumina thus rendered fluid could be reduced by carbon at a much lower temperature than is required to do it in the electric furnaces.

You will have gathered from these remarks that I am by no means wedded to the idea that we will find the final solution of the aluminium problem in electrical processes. I consider that they are handicapped by an extensive plant, and although electrical processes are "on top" at present, and I think will stay there for some time to come, yet I am far from considering that they may not possibly be superseded by non-electric methods of reduction. I do not consider the sodium processes, however, as ever likely to take part again in the metallurgy of aluminium. I think their day is past, but I now refer to methods of reduction by common reducing agents. Those who have read the literature relating to this subject must have concluded that almost every possible or impossible means of reduction has been tried, with but slender success. Calvert and Johnson produced iron-aluminium alloys with as much as twenty-four per cent. of aluminium by the reducing action of iron on aluminium chloride. A similar alloy, with three and one-half per cent. of aluminium, was made by Faraday and Stodart, by the reducing action of highly-carburetted iron on alumina. Pig irons have been analysed containing as much as one per cent. of aluminium. Zinc will, under some circumstances, reduce small amounts of aluminium chloride and cryolite. Half a dozen of the common metals can reduce aluminium sulphide, among which tin seems to do it easiest and most completely. Under peculiar conditions, zinc will overcome the affinity of aluminium for oxygen. We have in several places come across the fact that carbon reduces alumina at a temperature elevated enough to fuse the alumina. So, while ordinary reducing agents have been tried in almost every conceivable way, I hope and believe that they will yet come to the front as important factors in producing cheap aluminium.

Gathering all the threads together, the general conclusion is, I think, that progress, very satisfactory progress, has been and is being made. Rome was not built in a day, and I, for one, am quite satisfied with the progress of the aluminium industry. Six years ago aluminium sold for 12 dollars a pound, three years ago for 5 dollars, to-day it is being sold in England at 1·50 dollars, and before this year is out it will probably be down to 1 dollar. Aluminium was never before sold as cheaply as it is now. The prospects for cheaper aluminium were never more promising than they are to-day.

---

Messrs. Hinton, of Bedford Street, have shown us a neat little carrier for celluloid films, which can be readily inserted in the double back. It consists of a backing of thin Russian iron, to which is attached by a cloth hinge a frame of the same material. The celluloid film shut in between these, with the dark slide spring pressed against the back, remains perfectly flat during exposure.

What is the Colour of Oxygen?—Till now it was believed to be as colourless in the liquid form as it is in the gaseous. But the Polish chemist Olszewski shows that it is only because thin layers of it have been examined that liquid oxygen has been believed to be without colour. He has succeeded in getting a layer of it 30 millimetres thick, and he finds that it has a bright sky-blue colour. The discovery is very important in point of view of the absorption spectrum of oxygen.

## Notes.

A reminder that there is danger even in the developing cup comes to us from far-off Baltimore. Mr. E. C. Tweedy, a well-known photographer there, met his death the other day by mistaking in the dim light of his dark room a solution of pyrogallic acid for a glass of whisky and water. He knew the danger he was in, and without delay took a powerful emetic, and for the time apparently recovered; but the poison had entered too far into the system, and in three days he was a corpse.

This terrible accident will do some good if it will impress upon the minds of photographers that the pyro which is in such every-day use is a virulent poison. Most men are careful to keep cyanide and corrosive sublimate under lock and key, for they know what terribly poisonous substances they are. The chemist, too, will be careful not to sell the smallest quantity of either without knowing his customer, and getting his signature in the "poisons' book." Nor will he hand the poison over the counter unless it be confined in a stoppered bottle, and labelled with a red inscription. Not so with pyrogallic, which it is customary to sell without any poison label, and which would readily be handed to the smallest child without hesitation.

There is an amusing article in this month's *Strand Magazine*, describing the daily work of an East-End photographer, and how he is constantly called upon to take the portraits of the cosmopolitan inhabitants of that part of London. Anyone who is acquainted with the neighbourhood will know that this account of its population is not far-fetched, for nearly every country in the world is represented here. It would repay any photographer to made a study of this curiously mixed population, and he could do it with comparative safety now, for the stringent police regulations have gradually tamed the wild populace into something like order. Twenty-five years ago it was different, for it was then not safe for a stranger to walk up Ratcliffe Highway after nightfall. Ratcliffe Highway, indeed, gained such an unenviable notoriety that its name was changed, and with its change of name it seems to have changed its character.

In the article referred to, we are told that the stock-in-trade of an East-End photographer is not an elaborate one, and that he may pick up the whole of his apparatus for £5. We are told, too, that the studio and fittings are not expensive. The price of ferrotype plates and frames is also given, and we are informed that the chemicals cost an infinitesimal sum for each photograph taken. At this cheap original outlay the East-End photographer on a good day has a turnover of between £2 and £3. Of course there are ups and downs, and trials of temper and patience to be considered, but we cannot agree with the writer when he alludes to "the unhealthy nature of the business." Perhaps he is not quite up to modern methods of photographic production.

The weak point of photography is, that no sooner has anybody discovered anything, than it is discovered that somebody else has discovered it before him. A paragraph has solemnly gone the rounds of such papers as are interested in photography that a certain Herr Eggenneiler has been trying to take portraits in a studio without a glass roof. We are told, with all the circumstance befitting a novelty, that Herr Eggenneiler's studio faces north, that the northern wall alone is built of glass, and is about twice the height of the southern wall. Wonderful! What a pity that such a studio as this should have been described at least twenty years ago in the Photographic News. It is a bad thing for photographers to have good memories.

A gentleman well known in Edinburgh photographic circles is making an interesting experiment. He is engaged in collecting the portraits of photographic celebrities, and would be glad to enter into communication with others so interested for mutual help. We are afraid he will want a good deal of help. The shoemaker is always the worst shod, and the photographer usually has no portrait of himself. The exceptions to the rule are generally the results of some experiments for the testing of a new lens, or what not, made on those occasions when one photographer, like Dickens's veteran waiter, spends a holiday by helping another in the same line.

The two hundred persons or more who were recently victimised by means of a bogus portrait club owe no thanks to the Public Prosecutor. Although sufficient evidence was laid before this functionary to show the true character of the business, he could not see anything beyond the county court as a remedy for the deluded subscribers. It was owing to the perseverance of the police that the swindler is now suffering a term of imprisonment. Photographic portrait clubs, whether real or fictitious, appear to be beyond the ken of the Public Prosecutor.

An amateur friend complains that all advice given him is not profitable. Comparing notes with one more experienced than himself as to the difficulty of keeping the focussing-cloth in its place when photographing on a breezy day, he was recommended to cut a hole in the cloth and slip it over the lens; this would keep it down in front, while a couple of tapes at the opposite corners tied round the neck would enable him to defy the strongest gale. He tried the method, with the result that he smashed his camera. The plan, no doubt, is an excellent one if you don't forget to untie the tapes on hastily withdrawing your head. For want of this precaution, our friend dragged his camera as well as his head, with the consequence already described. He prefers his old method of stuffing the two corners of the cloth in his mouth and holding them with his teeth. He says you soon get to like the flavour of the cloth.

The Society for the Prevention of Cruelty to Children appreciates the value of photography. The annual report just issued is illustrated with portraits of the unfortunate little ones who have come under the cognizance of the Society. There are photographs of them in all stages of emaciation, and there are photographs of the same children after a few weeks' care and kindness. The idea is of course not new, as it is largely made use of by Dr. Barnardo, and before him by Miss Rye, but it is none the less effective as an appeal for sympathy.

## PHOTOGRAPHIC FRAUD.

BY JAMES MEW.

"IF," says Bossuet, in one of his sermons, "those people of rank whom it has pleased God to place in the highest offices were not ever wont to apply all their strength to sustain truth and right and justice, the earth would be desolate, and fraud unlimited." The learned ecclesiastic had a poor, but perhaps correct, opinion of the majority of mankind, strangely at variance with his view of those set in authority over them. The moral divergence of these two sections of the community, the governors and the governed, is not, however, conclusively established. The Turks have a proverb, *Hamin tash hamin dibac*, to the effect that pestle and mortar is all one. That every art and science, every trade and industry, every branch of human skill or handiwork has been limed by deceit to catch the incautious, will be generally admitted. Photography has not escaped this pollution. Almost as soon as it was born the touch of fraud defiled it, and it has not thrown off the poison in adult age.

Many frauds labelled photographic seem not fitly to be so called. The artist, for instance, who advertises for an assistant—an artist as well known to most men as the "old soldier" in a subscription to a missionary fund for the conversion of the Jews, or some other purpose equally excellent—and requires specimens of that assistant's handicraft, which the advertiser keeps when good, and exposes in his own show-case as his own work to beguile the passer-by, is not to be differentiated, by the fact of his thus obtaining photographs under false pretences, from the ordinary swindler. When, after the police have been set upon his track, he affirms, with all the earnest asseveration of the injured, that he has just returned the specimens by post, his lie is that of the common rogue who also remits any incriminating articles as soon as he sees the policeman's back. The thoughtlessness of the would-be assistant contributes greatly to the success of this species of imposture. A very little acquaintance with mankind should be enough, and more than enough, to induce any person of any degree of any intelligence to verify, before sending his specimens, the address, and profession, and commercial status of the advertiser who asks for them.

The spendthrift who politely begged his rich uncle to sign his name in the slit under his portrait in a photograph album, could hardly be charged with photographic deceit, though the uncle afterwards discovered that, instead of writing on his "cabinet," he had written on a cheque for £500.

About pirated copies of photographs, sold to hawkers at some half-dozen shillings a gross, a loud and bitter cry has gone up, but these are by no means photographic frauds.

By the manufacture of fraudulent lenses, as by the adulteration of chloride of gold, the photographer is himself deceived. As early as 1864 foreign lenses were sold bearing an English name. The celebrated optician, Dallmeyer, suffered considerably from this species of imposture. Treacheries of a cognate kind were all too frequent in many other trades. For instance, Geneva manufactured the works of a watch; England supplied the case. The chronometer was then described as an English watch. Arguments were not wanting to defend such a description, however iniquitous and untrue it may at first sight appear. Finally, such false trade descriptions were prohibited by an Act of Parliament, passed by the legislature, against the fraudulent marking of any goods of sale whatsoever.

This matter of the lenses is also a fraud connected with photography rather than a photographic fraud. It is of a piece with many other impositions in which the photographer is the patient, not the agent. For instance, in the matter of payment, how often is the unhappy artist deceived. What man is there who is not acquainted with the old, old excuses, "I have forgotten to bring my purse with me," "I was never asked to pay so soon before," "I will write and send you a cheque," "If you will call to-morrow I will take care that the money shall be ready," and so on, while the photographer who has had to pay cash for his chemicals, and instruments, and furniture, and instruction, grows as lean as Cassio, or leaner. If, on the other hand, the artist gives credit, let him ponder the true tale of the photographer and the widower's tomb. "I want," said the mourning widower, "the tomb of my late beloved wife photographed." It was done. "This," said the bereaved husband, "is not enough; I should wish some of her relatives to surround it, including my mother-in-law." This also was effected. Then said the unhappy man, "I cannot see the tomb for the relatives; there are too many of them, and the date of my wife's decease is obscured by the feather in my mother-in-law's bonnet." In fine, he would pay nothing. It is gratifying to know that in this case the aggrieved photographer obtained the full amount of his bill and costs.

In 1862, the mania of collecting already used and so, apparently, further useless postage stamps, was in the zenith of its popularity. The end and object of this collection has, it is believed, been never yet clearly understood. Statements have, indeed, been circulated that these old stamps might be sold to Government at a high price; that they were instrumental in procuring the admission of a lunatic into an asylum depending upon charitable donations—a statement which, indeed, might very well be true, though not in the sense in which it is commonly understood by the acolytes of what is called, with perfect gravity, the science of philately; and that they were admirably suited for papering walls, a work which, in loathsome tediousness, might surely eclipse the labour of Hercules in the Augean stables. But whatever the motive of collection may have been, photography was at hand to produce in large numbers the article collected. Counterfeited stamps with cancel marks and all complete, defying detection, were produced by the camera with the greatest ease.

In how many albums—fashionable toys of the time—now forgotten and cast aside into a dusty lumber room, are such photographic relics enshrined, foreign stamps of remote countries and islands far away, printed in dark neutral tint, brown, black, or purple, colours favourable to the fell purpose of the dishonest tradesman. Regarded once with an affectionate reverence to which they were as little entitled as many other objects of veneration which, since it is the highest pleasure to be well deceived, have given so great joy to mankind in their generations, they now lie apart from the busy progress of life, uncared-for and unseen, sad memorials of the transitory nature of the human preferences which called them into existence, through the mechanism of a photographic fraud.

*(To be continued.)*

THE Society of Amateur Photographers of New York has discontinued the publication of its journal, which will now be merged in the new *Photo-American Review*.

## STAINING FILMS TO PREVENT HALATION.

BY P. C. DUCHOCHOIS.

Halation is a blurring, or luminosity, extending in the shadows from the edges of the lights of the picture, often seen around the branches of trees in landscapes, the roofs of buildings, the windows in an interior, &c., so that the edges of these objects, instead of being well defined by sharp lines, seem to be confused, as it were, with the sky or the high lights. It occurs whenever a brilliant light is opposed to shadows or a much less bright light, and when white is just opposite to black; in the latter case by long exposure time.

The most general cause of this defect, so often observed in photographs taken out doors, arises from the rays of light reflected, after passing through the film without being wholly absorbed, by the back of the glass plate acting as a mirror, and again impressing the film, but outward of the point of incidence, according to a well known law of physics. The remedy suggests itself—namely, to paint the back of the plate with an opaque material which absorbs the light; "Gihon's Opaque" is generally employed. A similar water paint can be prepared by grinding into a paste the following ingredients:—

| | |
|---|---|
| Burnt sienna ... ... ... ... | 16 parts |
| Dextrine ... ... ... ... ... | 4 ,, |
| Glycerine ... ... ... ... | 2 to 3 ,, |
| Water ... ... ... ... ... | quant. suff. |

Halation occurs most easily by long exposure time, even with plates backed as said above. The cause is then complicated by the reflection from the molecules of the silver haloids not forming a continuous layer, but agglomerated into grains of more or less volume. It has been said by Captain Abney that these grains not only reflect the light, but disperse it in various directions. This, of course, would produce the defect in question if the exposure time has to be lengthened so long as, for example, it is necessary when photographing the "Milky Way"; for if a bright planet like Jupiter or any other orb is in the field of vision, it will certainly be blurred by irradiation.

The blacking of the back surface of the glass plate, although useful, is, in such a case, insufficient. The sensitive film should be dyed to completely absorb the light, especially the most active rays. Here we must let Mr. Carey Lea explain the best manner of preparing the sensitive film. Moreover, the process is due to him. We quote from his excellent "Manual of Photography":—

I believe that I may claim to have been the first, now many years since,* to propose the method of *colouring the film* to accomplish this result (to prevent blurring). The difficulty lies in this, that most colouring matters applied to the film distinctly diminish the sensitiveness. I have lately compared all the colouring matters that have been suggested for use, and also very many others, and find *scarlet coralline* to be the best. Coralline has been tried before, but always with a diminution of sensitiveness. . . . I have been so fortunate as to find the method of using coralline which avoids this difficulty *wholly*. . . . This result is accomplished in the simplest manner. It is only necessary to add the alcoholic solution of coralline to the finished emulsion, and employ it precisely as usual. Neither is there any necessity of removing the colour from the plate. This I consider a fatal objection. Coralline has the inestimable advantage that it disappears of itself in the operations of developing, fixing, and washing.

The best scarlet coralline (the yellow coralline sometimes called *aurine* is entirely unsuitable) is to be dissolved in alcohol, forty-eight grains to the ounce. The solution takes place rather slowly, and several days should be allowed, with occasional shaking. Neither is it ever entirely complete; a small amount of dark residue always remains, even after standing for months. To each ounce of finished emulsion* from six to ten minims of this coralline solution is to be added and well shaken. The emulsion is then ready for use. It will not have the strong red colour of coralline, but a buff or salmon shade.

* This was written by Mr. Carey Lea in 1876.

We have used this process with our emulsion, and also with silver bromo-gelatine plates dyed by the bath method, and always with good results. This we, perhaps, need not state, for the authority of Mr. Lea is more than sufficient to recommend this process.

It is to be remarked that the coralline dyed plates are orthochromatic, being colour-sensitive to yellow extending to orange.

The process of Mr. Lea reminds us of another one, published, I think, in Seely's *American Journal of Photography* for 1858 or '59, which also gives orthochromatic effects. It was not, however, published for that purpose, for the author of it had not any idea of the principle, discovered by Dr. H. W. Vogel, upon which are based the orthochromatic processes, but to prepare a film *less permeable to the luminous rays, in order to avoid solarisation and obtain better half-tints.*

In my note-book I found the formula following, with the name of Sanders as the photographer who devised it:

| | |
|---|---|
| Ether conc. ... ... ... ... | 4 fl. drams |
| Alcohol, 98 degrees ... ... ... | 4 ,, |
| Ammonium iodide ... ... ... | 10 grains |
| Cadmium bromide ... ... ... | 5 ,, |
| Pyroxyline ... ... ... ... | 10 ,, |

To which should be added 1 ounce of a filtered solution prepared by letting macerate for several days 1 ounce of curcuma in 4 ounces of alcohol. In my note-book I remark that the above quantity was too great, and that by adding only half of it with 4 drams of ether the collodion worked well, yielding good intensity.

It is very curious that so long ago as 1858-59, dyes were used in photography to obtain better half-tints in the dark or coloured parts of the objects to be photographed, and that this should have passed unnoticed.

In concluding, we advise the reader to back *always* the plate with an absorbent of light and to use dyed film, as by so doing he will obtain pictures quite free from halation and exceedingly sharp all over, which is the natural consequence.—*The Photographic Times.*

* The chloro-iodo-bromide (collodion) emulsion, prepared according to the formula given by the author, Mr. Lea.

---

Another Process for Preparing Oxygen Gas.—Another process for preparing oxygen gas is described by G. Kassner as follows:—Bioxide of barium in contact with ferricyanide of potassium, in presence of a little water, evolves a gas which, on examination, proves to be pure oxygen. At the same time a change of colour occurs, as the ferricyanide passes into the state of ferrocyanide. If the quantity of water is sufficient, the whole is dissolved, except any insoluble impurities which may happen to be present in the barium bioxide.

At the County of London Sessions on Thursday, last week, William Edward Parker was brought up before Mr. Loveland Loveland, sitting at Clerkenwell, for sentence. The prisoner was found guilty of having defrauded a number of persons through a "photographic club" which he professed to carry on at Carlton Terrace, Harrow Road, and in the Uxbridge Road. Mr. Burnie was for the prosecution; Mr. Willes for the defence. It was stated that as many as 300 persons have made complaints against the prisoner. He was sentenced to ten months' imprisonment with hard labour. Detective Mott was commended for the manner in which he had investigated the case.

## THE HOKE ENGRAVING PROCESS.

This process, by which a printing block can be produced with great rapidity, has lately come into extensive use for line-work illustrations in newspapers. Although it does not depend upon photography, the matter is one of interest to photographers, if only in showing that they have a rival in a field which they were justified in thinking all their own. The process is wonderfully simple. A blackened iron plate is covered with a soft chalky composition, forming a layer of about $\frac{1}{32}$ of an inch in thickness. Upon this surface the artist makes his sketch, and proceeds to cut through the lines with an etching point until he exposes the dark metal beneath. He is thus able to see the effect of his work as it proceeds as easily as if he were working with pen and ink. The Hoke Engraving Company supply the prepared plates at so much per dozen, and when the drawing has been etched in the manner described, they will undertake to make a printing block from it. To do this, the plate is transferred to a casting box, which consists of a metal receptacle heated by gas, and round its edges are fixed metal bars one inch in thickness. The picture, face upwards, thus lies in a kind of well. A lid is screwed down, and the box turned up to the vertical position. Through an opening left at one end molten stereotype metal is now poured into the box, and not only covers the drawing, but flows into every scratch made by the etching needle. In a few minutes the metal cools, and is then turned out of the casting box in the form of a block ready for the printing press. The annexed sketch was executed in the way described on a plate sent to this office for trial, and by one who had never before practised the method. It proves, we think, that the system, in experienced hands, must be capable of good results, even if specimens examined by us had not already convinced us of the fact. The office of the Company is at 58, Fleet Street, E.C.



## THE DECOMPOSITION OF SILVER CHLORIDE BY LIGHT.

BY ARTHUR RICHARDSON.

The author described experiments which have been made with a view to determine whether silver chloride which has been darkened by exposure to light under water contains oxygen. The nature of the change which occurs during decomposition of the chloride was also studied with reference to the part played by water.

Pure silver chloride was prepared by addition of dilute chlorhydric acid to a solution of pure silver nitrate, the precipitate being washed by decantation till free from acid. The following facts were observed during exposure :—

1. Oxygen was evolved, a part of which was present as ozone.
2. When small quantities of water were present, chlorine and hydrogen chloride were found in solution.
3. When a large volume of water was taken, hydrogen chloride, but no chlorine, was detected.

The influence of hydrogen chloride in retarding the decomposition of silver chloride is considered, and is explained from experimental results given, which show that even minute quantities of hydrogen chloride exercise a marked influence on the stability of chlorine water when exposed to light, the rate of decomposition of the silver chloride being dependent on the readiness with which the chlorine in solution and water interact to form hydrogen chloride. Thus, when silver chloride was exposed to light in a solution of hydrogen chloride containing 0·9 part per 100 of solution, the total chlorine liberated was 0·201 gram, of which 13·7 per cent. represented free chlorine, whilst for the same weight of silver salt in pure water the total chlorine found was 0·276 gram, of which 0·9 per cent. was present as free chlorine.

In the examination of the darkened product for oxygen, a portion of the substance was taken which had lost 8 per cent. of its total chlorine during exposure. After it had been dried at 110° C. till it ceased to lose weight, it was heated in a current of pure hydrogen, the gaseous products of the reduction being passed through a weighed phosphorus pentoxide tube. Before using this substance as an absorbent of moisture, it was ascertained that hydrogen chloride was not absorbed by it after contact for a few hours only, as the weight of the tubes remained unaltered in contact with the dry gas. The hydrogen was prepared by the action of steam on sodium, numerous precautions, which are described in full in the paper, being taken to preclude errors.

The results show that the gain in weight of the drying tubes after the decomposition of the silver compound, which lasted from seven to eight hours, is so small as to preclude the possibility of the presence of an oxygen compound in the darkened product. The darkening of the carefully dried chloride was also observed to take place when exposed to light in a tube containing dry carbon tetrachloride from which all air had been removed by boiling. From these facts the author concludes that the darkened silver compound is of the nature of a subchloride rather than an oxychloride.—*Proceedings of the Chemical Society.*

Club der Amateur-Photographen in Wien.—C. Srna writes that, owing to the printers' strike in Vienna, "the issue of the Exhibition catalogue with the English preface was unduly delayed, as it was impossible to get it printed."

## AUTOMATIC PHOTOGRAPHY.

When first the idea was mooted, now some two years ago, that the penny-in-the-slot principle could be applied to photography, the knowing ones shook their heads and smiled. Perhaps they did not like to admit that an art which had cost them so much pains to acquire, and which they had always been so careful to describe as being dependent upon intelligent handling of apparatus and chemicals rather than mechanical in its nature, could possibly be practised by the mere modification of a machine whose usual work was to dispense chocolate and butter-scotch. Others argued that, seeing that the kodak, with its simple formula, "You touch the button, and we do the rest," was an established success, the penny-in-the-slot machine, being as simple in theory, ought, too, to bring fortune to its promoters. At any rate, many believed so far in the possibilities of the new machine as to back their opinion by cash, and the inevitable company was formed and floated without difficulty.

For some reason or other the promised machines did not make their public appearance very speedily, and many were the comments in the photographic press as to the probable cause of the delay. The whole of last summer slipped by, and the company took no toll from its brilliant sunshine. The chocolate and butter-scotch, the cigars and cigarettes, the squirted drop of scent on your hand-kerchief, the fuzees, the postcards, and all other articles which it is possible to dispense automatically, continued to find ready customers, but the photographic machine was not.

But with the present year the void has been filled, and at most places of public resort the automatic machine may now be noticed. In appearance, a cross between a parish pump and a pillar letter box, rearing its head above its surroundings—a thing not of beauty, but one which seems to arouse much curiosity. At the Naval Exhibition alone there are twenty-one of these automatic machines, and, as far as we could judge from casual observation one day last week, when the sun vouchsafed to show itself for a few hours, they met with much custom from the sight-seers there assembled. Naturally, being well disposed ourselves towards photographic enterprise in any form in which it might show itself, we invested several pennies in these machines, and are, therefore, in a position to say something about the way in which they work, and the pictures which they turn out; and we may at once say that our experience was not solely gleaned in the grounds of the Naval Exhibition, for we had, before its opening, observed the behaviour of several of these penny-in-the-slot contrivances at other places.

Our first interview with the machine—if interview it can be called—was outside a large draper's shop in North London; but upon expressing a wish to have our photograph taken, we were told that the apparatus was not at work. We, however, took stock of the machine, and read the instructions, which were to the following effect: "To obtain a photograph, stand about three feet from the machine, looking into the mirror. Then place one penny in left-hand slot, and remain steady until the bell (inside the machine) rings. In about forty seconds the photograph will be delivered." A further notification pointed out that another penny dropped into the right-hand slit would bring forth a gilt frame. We also learnt that "the Company does not hold itself liable for any failure if the above instructions are not strictly adhered to."

We certainly felt grieved that we were not able to spend our penny, and were beginning to feel annoyed at the closure of the apparatus when a further notice attracted our eye. This one seemed to be a kind of after-thought, for it was a simple printed notice stuck on to the painted surface of the apparatus. "The public are recommended not to be photographed on dull or foggy days." Well, the day in question was certainly dull, but, as the authorities had put it quite out of anybody's power to be photographed, the notice seemed to be superfluous.

The next day was brighter, and we journeyed to Hampstead Heath in order to see what automatic photography could do for us there. Here we found two machines, and we comforted ourselves with the assurance that if one was not available, the other surely would be. The first machine is in the Vale of Health, and we found it without difficulty; but it bore an ominous label padlocked over the lens aperture, and this label bore the word "Closed." A small crowd stood around the contrivance, as if they expected it to "go off," or, at any rate, to perform in some way or other. Their presence was, no doubt, partly due to the circumstance that an attendant stood by the machine, as if ready to act in case of emergency, for a man who has the temerity to stand still and do nothing is pretty sure to attract a crowd. We were told by a bystander that the thing wouldn't work this morning, and that the other machine round the corner had also struck. He further expressed the opinion that "the 'ole bag of tricks is a blooming fraud." We simply repeat his remark in the strange language in which it was expressed.

We then walked round to interview the other machine, in front of which was a larger crowd, perhaps three dozen in all. There was evidently something going on here, for the attendant was in the act of adjusting the mechanism inside the apparatus, through a kind of man-hole in its side. As we approached, he shut up the door with a snap, put an iron cover over the lens opening, locked it up, and walked away, leaving the crowd of would-be models behind, still gazing at the enigmatical machine. On enquiry, we learnt that "something had gone wrong with the concern," and that the man had gone to fetch some "stuff" to put it right again.

We waited patiently for his return, and in due time he made his appearance accompanied by another man, who was evidently his superior. Between them they re-opened the machine, and began to wrestle manfully with the hidden mechanism. After it had clicked spasmodic-ally for a few minutes, we were told that it was ready for work. With a beating heart we stood three feet in front of the mirror, handed the man the penny to drop into the slot, and, after an anxious five seconds, were released from our constrained attitude by the ringing of a bell. Click, click, click, went the machine—and then stopped. With a frown on his brow, the attendant opened the man-hole and shut it again with a bang in order once more to start the mechanism, and again the clicking was resumed. Our thoughts wandered away for the moment to the glories of Astley's amphi-theatre in the days of our boyhood, when there was a tradition to the effect that before Mazeppa's "fiery untamed steed could be induced to start on his wild career," it was necessary to bang an old omnibus door behind the scenes. The bang of the apparatus man-hole had the same effect, and the clicking went on for about forty seconds, when the portrait was duly delivered.

We now approach a rather delicate subject. We have never been afflicted with any great amount of conceit about our personal appearance, but every man has a sort of idea of the kind of man he is—a faulty idea, no doubt, for the image that he sees in the looking-glass is a reversed one. Still, he may be said generally to be able to recognise his own portrait. We recognised the one taken by the automatic machine—which, by the way, is certainly not automatic in its action—by a book which we happened to be holding at the time the picture was taken. This book was the one high-light in the composition. The rest was not only black, but the features were distorted, and the chemicals formed an ornamental marbling over the surface of the picture. We had another try, but it was no better, and since that eventful day, many are the pennies which we have sacrificed in the hope of getting something satisfactory out of the machine. The best of these we picked out and showed it to an intimate friend in triumph. "Who is that?" we said. "Oh! I've seen that thing long ago," was the reply; "it's the mummy of Pharoah." After this we changed the topic of conversation.

## PHOTOGRAPHY IN THE CELESTIAL EMPIRE.

BY ROMYN HITCHCOCK.

I have been somewhat agreeably surprised to discover the interest manifested in photography by many residents in China. Here in Tientsin—which is a very large Chinese city, with only about two hundred foreign residents—the Tientsin Amateur Photographic Association was organised last January, with about twenty members. The United States Consul at this place (Dr. William Bowman) is one of the active members, frequently to be observed active in snapping the detective which he recently obtained, and there are a number of others who are very successful with cameras of various kinds. The secretary of the Society is Mr. H. J. Bostwick. The present writer is not a member, being only a sojourner in the land; but it was his privilege at the first meeting to give a demonstration of eikonogen development with the last portion of that agent he possessed. Eikonogen in crystals does not keep well; the surface turns black, and, to make a solution of the proper colour, it was my custom to weigh out double the quantity required. Wash it in water, which readily dissolves the black portion, and then dissolve the white residue in the sulphite and alkali. A serious loss is thereby sustained. Owing to the difficulty of obtaining good eikonogen, I have returned to the use of pyro. Perhaps the dry powder preparation recently introduced will once more bring the former agent into favour in this distant land. Peking has several very successful amateurs.

At Shanghai there is the China Camera Club, with about forty members. I am not acquainted with the work at Shanghai, but Mr. W. S. Emens, the United States Vice-Consul General, is an active member of the Camera Club, and has had considerable experience.

Plates from the United States are not much favoured in North China. The reason for this is not obvious; but it may be because they are not much known, and that there is nobody to introduce them. Seeking for information, I asked the salesman at Hall and Holtz's why the American plates were not used, as they could be furnished so much cheaper. I thought 6.50 dollars an exorbitant price. He told me that American plates were not good!

The demand for plates in China must be very large. The Chinese do considerable work themselves. Most of it is of an inferior quality, it is true, but the same may be said of much of the work by foreign professionals. These strictures apply to North China and particularly to this city and to Peking. I would gladly do whatever I can to introduce our own plates in China, but as a primary step I would wish positive assurance that the plates should be packed to meet the requirements of the trade. This would involve the use of paraffined paper to protect them from moisture, the plates being wrapped in packages of four, with at least three separate wrappings of such paper. Thus, if shipped in metal-lined cases, they would come *via* Suez Canal in good condition, and they would keep through the wet season at Shanghai or Hong Kong, when unpacked. It is a too common impression in the East, that certain makers of plates in the States have been so unwise as to send inferior plates to Japan and China, thinking to get rid of them to the unsuspecting Celestials. While I do not credit the story, I do know of one instance which partly justifies it to those who did not know the circumstances of the shipment.—*Abstracted from Anthony's Bulletin.*

## Notices of Books.

Monte Rosa and Gressoney. By Vittorio Sella and Domenico Vallino.

This work, lavishly adorned with phototype blocks and collotypes, is a very good example of what photography is capable of in the way of book illustration. Sig. Sella is well known to most of our readers as a photographer who can do good work, and the pictures in this handsome book are a further tribute to his talents. They are full of beauty, and have been so wonderfully reproduced by the collotype process that it is difficult to believe that they are the result of a mechanical operation. The snow scenes are especially admirable, and half-tones and pearly shadows are as well represented as they could be in the most carefully executed silver or platinum print. The pictures have been taken in a district where, up to the present, the footfall of the ordinary tourist is seldom heard, where the people live a primitive life, and where language and costumes are alike strange. There are few such places left in Europe, and the authors have done well to seize photographic records of a state of things which the railway must presently extinguish for ever. In a private letter, Sig. Sella tells us that the book was completed in two months, and that its price is only fifteen shillings, so that he can claim both rapidity of production and cheapness for the form of publication. The text is Italian. Copies of the work can be obtained of Messrs. Spooner, 379, Strand, but they are not likely to remain for long unsold.

The Photo. American Review is a new monthly publication of novel design, and published in magazine form. The first forty pages are occupied by photographic matter, including a large number of well executed phototype reproductions, while the rest of the work—some sixty pages—is taken up with a record of all new books, and a review of no fewer than five hundred and thirty. These works consist of current literature of all kinds. The publication thus appeals to general readers as well as to photographers, and it is so well done that it should, we think, prove both useful and successful. The price is twenty-five cents, and it is published by H. C. Jones, of New York City.

Agenda de L'Amateur Photographie pour 1891.—This is a useful little book of the type of so many published in this country for registering particulars of negatives taken, plates used, time of exposure, and so on. It contains a clever little movable disc, which will give the approximate exposure necessary for different hours in different months. It also comprises a number of useful formulæ, with a column for observations and modifications by the user. It is compiled by E. Forestier, and issued by the *Société Génerale d'Editions*, Paris.

The same publishers have sent us a copy of L. Mathet's Etude Complete sur le Developpement et les Developpateurs, which is uniform with several other little manuals which have been issued under the auspices of the journal, *L'Amateur Photographe.* It deals with the dark room and its fittings, and gives detailed directions for development with pyro, ferrous oxalate, hydroquinone, and eikonogen. It also indicates the modifications which are necessary during development in treating different kinds of subjects. The last chapter is a most useful one, for it points out how temperature influences development—a part of the subject which is too often completely neglected.

## Patent Intelligence.

### Applications for Letters Patent.

8,055. Herbert James Tear, 12, Clapham Road, Stockwell, London, "An Improved Photographic Magazine Camera, and Appliances used therewith."—May 11th.

8,121. Bernard Krantz and Hermann Zeissler, 61, Chancery Lane, London, "Improved Method of Photo-Etching on Zinc and Copper."—May 12th.

8,210. Walter Griffiths, King's Heath, "Improvements in Dark Slides to Cameras."—May 13th.

8,213. Francis Hayes, 70, Cheriton Square, Upper Tooting, "Miniature Photographic Album ; also Larger Size, with one or more Miniatures on one Sheet ; also for Advertising on Programmes, Books, &c., and in any Process."—May 13th.

8,232. Bertel Georg Pagh Moller, 46, Lincoln's Inn Fields, London, "Improvements in Photographic Cameras."—May 13th.

8,272. James Charles Richardson, 23, Claremont Square, London, "Electro-Magnetic Inductography, and the Electric Transmission of Light Images or Telephotography."—May 14th.

8,283. George William Hart, 3, Buckingham Road, Harlesden, "Photographic Sculpture, Carving, or Engraving."—May 14th.

### Specifications Published.

18,583. *November 20th*, 1889.—"Improvements in Optical Lanterns." Alexander Hughes, 59, Fenchurch Street, London, Optician.

The invention relates to that class of lanterns generally known as "optical lanterns," such as those used for projecting views upon screens by means of artificial light, and is particularly applicable for lanterns of the triunial, biunial, or single type used for producing dissolving views. It consists in the construction and arrangement of the lanterns in triple, double, or single form, whereby the following advantages are obtained over the lanterns now in use.

1. When triple or double lanterns are used of the ordinary description, only one set of lenses, with condensers and lighting apparatus, work upon a true optical axis. Now, assuming that, in a triunial lantern, the centre set of lenses is the one working as above described, the lenses of the upper and lower lanterns have to be inclined to the centre lantern in order that they shall each project the image upon the same part of the screen as the centre lantern. This is usually effected by throwing the front set or objective lenses of each top and bottom lantern out of the optical centre in relation to its condenser, thus causing distortion of the picture, and destroying the sharpness of detail in one part of the view or the other. These disadvantages are entirely obviated by this invention, as each optical system or lantern is complete and independent in itself, and can be tilted to any convenient angle as a whole, with one or other lantern, as may be desired.

2. Considerable reduction in cost of construction is obtained, owing to the simplification and compactness of the design.

3. The weight is greatly reduced, as the material used in construction may be aluminium ; also much less space is occupied by the lantern as a whole.

4. The lantern will allow of all the various mechanical effects and slides now being used in the ordinary form of lanterns being fitted to it and worked, and the adjustments are arranged so as to permit of the projection of pictures from the smallest up to the largest size without further apparatus or adjuncts to the lantern.

20,964. *December 31st*, 1889.—"Pictures." J. R. France, New York, U.S.A.

Relates to the production of waterproof and indelible designs, pictures, prints, photographs, or the like, of any kind or colour, or on any material. Consists in fastening the picture on or between one or more transparent or semi-transparent sheets of pyralin or other pyroxyline compound. When two sheets are employed, they are cut larger than the picture so as to enclose the latter entirely. The pictures may have a backing of wood, cardboard, and the like. The surface of the pyralin is polished before or after fixing the picture thereto by pressing on metal plates, or by other suitable means. The pictures are secured to the plates by wetting them with alcohol, or other solvent of pyroxyline, and then pressing them upon the plates. The pictures thus produced may be used as veneers for furniture.

A New Pinchcock for Burettes.—A. Dannbacher describes a new contrivance for regulating the flow of a liquid from a burette. It may be called a pinchcock for want of a better term. Two circular pieces of wood are centrally bored, the hole being just large enough to permit the pieces being slipped over the rubber tubing connecting the burette with the nozzle. A portion of the interior of each piece is also bored out, and the surfaces of the two pieces which are to be in contact are roughened so that they will not too readily slide upon each other. The upper piece is now slipped over the tube, next the lower piece, while some traction is made on the rubber. This causes the lower piece to become pressed against the upper one and to remain in contact with it, no matter whether it is twisted or not. By twisting the lower piece the flow of the liquid may be exactly regulated, stopped, or kept at any desired rate.—*American Druggist.*

M. Eugene Faller describes in a French journal a plan for vignetting negatives during exposure, and so saving the trouble of using an ordinary vignetting glass or other apparatus in the printing frame, and he advances it as a plan which is not generally known. He claims for the process that a more perfect effect can be obtained than by ordinary means, and that any background can be employed from black to almost white. In a square of white cardboard is cut an oval opening of a size suited to the photograph to be produced, the edges of this opening being serrated. This card is hung by silken cords run through two holes pierced in its upper edge to a head-rest, or other suitable support, so that it can be placed about 12 inches in front of the lens during exposure. The image will thus be framed on the ground glass, and this can be perfected by moving the head-rest to the right or the left, and also vertically, as may be required. The negative is then taken in the usual manner. To obtain the best effect, light should be reflected upon the vignetting card, and this can be done by fitting over the camera another sheet of card provided with a hole through which the lens can point. It will be seen that the method described is identical with that in common use in this country for making vignetted enlargements, in which case a similar serrated opening in a card is kept in movement in front of the lens employed during exposure.

# Correspondence.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

SIR,—The Council of this Society will feel obliged if you can find room for the announcement below, as the exhibition illustrates an important application of photography which is but little used in this country, but is employed considerably on the Continent. The Council will be pleased if those interested will come and examine the specimens.

H. LAWRANCE, *Assistant Sec.*

50, *Great Russell Street, W.C., May 16th.*

*Photographic Society of Great Britain.*—There is on view, at the Society's Rooms, 50, Great Russell Street, W.C., a collection of prints in colours illustrative of the application of photography to chromo-lithography, chromo-typography, chromo-collotype, and chromo-photogravure. The specimens exhibited show the nearest approach that is possible in the present state of our knowledge to the solution of the problem of photography in colours. The exhibition will be open daily to the end of June between 2 and 9 p.m. Admission on presentation of a visiting card.

# Proceedings of Societies.

CAMERA CLUB.

MAY 14th was a lantern evening, and slides were shown by Messrs. D'Arcis, Pinkney, Fitz-Payne, Phipps Lucas, Chang, Charters White, Humphery, and other members.

The subject on Thursday, May 28th, will be a short paper communicated by M. Leon Vidal on "A Process of Mechanical Colouring for Carbon Transparencies, Stereoscopic Views, and Lantern Slides." At this or the subsequent meeting a paper by Prof. W. K. Burton, on "A Modified Silver Printing Process," will be read, and examples shown.

HOLBORN CAMERA CLUB.

THE monthly "instruction to beginners" night was held on Friday last, Mr. R. LUXTON in the chair.

Mr. A. J. GOLDING first demonstrated on the platinotype process. In the course of his remarks on the process, he said it would recommend itself to all amateurs for its simplicity, and also for its permanence. He developed (by the hot-bath process) six prints, all turning out successfully.

Mr. E. H. BAYSTON then demonstrated on bromide paper, printing from the same negatives as Mr. Golding had used for his platinotype prints. Using the hydroquinone developer, he obtained some excellent results.

Before the meeting separated, the secretary read a circular letter *re* Mr. Biden's proposed federation of societies scheme, and it was decided that, as it was understood that the Photographic Society of Great Britain had also a scheme in hand, it was desirable to wait and see if the P. S. G. B.'s scheme came to anything, most of the members being of opinion that two federated societies would end in the downfall of both.

SYDENHAM AMATEUR CAMERA CLUB.

A MEETING was held at the "Greyhound" on the 12th inst., Mr. C. D. BUDD in the chair.

Mr. L. WILTSHIRE read a paper upon "Silver Printing," &c. After a description of the methods of preparing the paper, various sensitising formulæ were given, and several practical suggestions made.

A discussion followed, in which part was taken by the president and other ex-workers of the old wet-plate process.

HACKNEY PHOTOGRAPHIC SOCIETY.

THE annual general meeting was held last Thurday, Mr. WALTER WESSON presiding. The following officers were elected :—*President*—Dr. Roland Smith ; *Vice-Presidents*—Dr. Ambrose Kibbler, Messrs. J. Hubert, Frank Jolly, and J. A. Sinclair ; *Treasurer*—J. O. Grant ; *Curator*—S. H. Barton ; *Council*—W. L. Barker, H. J. Beasley, Walter Wesson, A. Dean, F. Houghton, C. F. Hodges ; *Hon. Secretary*—Mr. Fenton Jones, 6, Victoria Street, Hackney.

The report (third year) was satisfactory, and recorded progress.

After the election, the HON. SECRETARY read a short paper on the different developers now used.

There will be an excursion on May 23rd. Train Liverpool Street (G.E.R.) to Wood Street at 2.16 ; meet at Wood Street 2.40, and at Whip's Cross at 2.50.

ENFIELD CAMERA CLUB.

THE annual general meeting was held on May 13th, the president, Mr. D. G. PINKNEY, in the chair.

The PRESIDENT, in moving the adoption of the annual report and balance sheet, referred to the satisfactory position of the Club, and considered that the members might reasonably congratulate themselves on the credit balance of £8 15s. on the first year's working of the Club.

The president and secretary, and the committee—with two exceptions, gentlemen who had left the neighbourhood—were then unanimously re-elected. One new member was proposed, and it was arranged that the next field-day should be held at Leigh, near Southend, on Saturday, May 30th.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).

AN extra lantern meeting was held on May 15th, with Mr. EDWARD LOVETT in the chair.

Mr. J. A. SINCLAIR, of the Liverpool Amateur Photographic Association, gave an illustrated lecture entitled, "A Scamper across Normandy with the Camera." Mr. Sinclair interspersed his lecture with highly interesting, curious, and laughable incidents. The series of pictures illustrating the lecture were of high technical excellence, the final picture of the evening, entitled a "Farewell to Normandy and the Seine," a sunset picture, being worthy of special notice.

On Saturday, May 23rd, there will be a half-day excursion to Groombridge ; train from London Bridge, L.B. & S.C.R., 1.40, East Croydon at 2.3 p.m.

GLENALMOND PHOTOGRAPHIC CLUB.

THE second meeting for the midsummer term was held on May 16th.

The chair was occupied by Mr. A. S. REID, who gave a lecture on the "Development of Instantaneous Photographs by a Mixture of Hydroquinone and Eikonogen," showing some prints the negatives of which were developed by that mixture.

Mr. R. JOHNSTONE also showed some prints, one of which was a photograph of the members of the Club, taken last Easter by himself.

At the previous meeting the officers of the term were thus elected :—*President*—Mr. A. S. Reid, M.A., F.G.S. ; *Hon. Secretary*—Mr. E. H. C. Craig ; *Hon. Treasurer*—Mr. L. H. Maxwell ; *Keeper of Books*—Mr. W. H. Maxwell ; *Keeper of Album*—Mr. W. G. Harrison. At this meeting five new members were elected.

PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the Photographic Society of Japan was held in the Masonic Hall, No. 60, Yokohama, on Friday, 18th instant. From a little after midday there was an exhibition of prints on the bromide paper that Mr. Cocking had presented to the Society a few months ago. Mr. Cocking offered three prizes at the time that he presented the paper, and these were awarded by ballot of members and of the public on Friday. Mr. K. Ogura, amateur photographer, won the first prize ; Mr. A. Futami, professional, the second. For the third prize, there were so many prints that received an equal number of votes that no decision could be come to at the time of the meeting. It was decided to leave this matter to Mr. Cocking. The members of the committee exhibited, but did not compete for prizes, and the work of Mr. C. D. West was particularly admired. There was a set of micro-photographs by Mr. I. Isawa that were considered to show great technical merit. Flash-light photographs, taken at various meetings of the

Society, were shown, and some by Mr. Kajima were particularly good.

Mr. K. Ogawa showed a large photograph of the interior of the Russian cathedral in Tokio. This, as a sample of interior photography—always very difficult—and also as a sample of collotype work, is as fine as anything of the kind that we have seen.

Mr. Cocking showed a large number of "Kodak" cameras. These instruments are highly ingenious, and are excellently made. The larger sizes—which have, it is believed, reached Japan for the first time—relieve the instrument from the stigma of being only a toy.

In the evening there was a regular meeting of the Society, when Capt. Kenderdine occupied the chair, and the following were elected members:—Messrs. Allan Owston, A. W. Forbes, George Brinkworth, T. H. Tanner, A. T. Watson, and J. H. Brooke.

Mr. W. K. Burton gave a demonstration of a modified silver printing process. Briefly put, the process consisted in making one solution of nitrate of silver, and another of "salt" (preferably chloride of ammonium), citric acid, carbonate of soda, and a little gelatine. The solutions are warmed and mixed, when an "emulsion" that is immediately ready for application to any surface that can be sensitised results. The process of making the emulsion, sensitising the paper, and toning prints by Clark's platinum method, was shown. Specimens of finished prints were also shown. Mr. Burton said that the process had not yet been long enough in use to know whether it had any real advantages, but the possible advantages that he saw were that a single solution that would keep fairly well could be prepared in a few minutes, and was at once applicable to any surface, whereas in all other silver printing-out processes there were either two operations—that of salting and that of sensitising—or a washed emulsion, which was comparatively troublesome to make, had to be used. The process was a cheap one.

Mr. West thought the saving of trouble was not great. So far as he could see, the advantage of the process was that it made it possible to get a blacker colour, one more nearly approaching to an "engraving black," than by the ordinary process.

Mr. Kajima made two exposures of the meeting by flash-light.

The hall was lent to the Society by Mr. O. Keil for this meeting, which ended with a vote of thanks to the chairman.

---

Explanation of Optical Activity.—Landolt divides optically active substances into three classes: those which rotate polarised light only when in the crystalline form; those which rotate it only in solution or when fused, that is to say, in the amorphous state; and, lastly, those which in both conditions show optical activity. Only one substance, strychnine sulphate, has hitherto been discovered belonging to the last class. The optical activity of crystals is generally explained by assuming for these a screw-shaped structure; that of liquids is referred to the nature of the chemical molecule, and, more particularly, to the presence of an asymmetrical carbon atom. The author does not regard the explanation of the optical activity of crystals usually given as satisfactory. It is not probable, and is not consistent with what is known of the symmetry of crystals. That the laws of circular polarisation are the same for both the crystalline and amorphous states, would also lead to the conclusion that the same explanation would hold in both cases. A key to this explanation may be sought in the fact that substances which are optically active when amorphous, crystallise in hemihedral forms. According to Sohncke, hemihedrism may be explained by assuming a certain polarity in the molecules building up the crystal. The author shows, reasoning from the fact that the molecule of an optically active substance contains an asymmetrical carbon atom, that circular polarisation may be explained by assuming that the axis of polarity of the molecule coincides with its axis of rotation, and with the direction which offers greatest and least resistance, according to the orientation of the molecule, to the passage of a ray of light.—*Journal of the Chemical Society.*

# Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

Old Amateur.—*Paper in Continuous Rolls.* Both the thick, smooth, and thinner sort can be obtained of Messrs. Waterlow and Sons, Winchester Buildings, E.C.; the paper, uncoated, in the smaller sizes might also be procured from the Eastman Company, 115, Oxford Street, W.

R.B.—*Tinted Films for Isochromatic Work.* Bathing the plates with erythrosine or Vogel's azaline has been recommended, but it is much more advantageous to tint the emulsion before spreading upon the plates. As an indication of your success, try them against the commercial plates of Edwards or Obernetter. The use of a pale yellow screen is not imperative.

D. L. P. (Sheffield).—*International Labels.* Probably by this time you will be able to procure them from Messrs. Percy Lund and Co., St. John Street, Bradford. If not, apply to M. Ch. Puttemans, Ecole Industrielle, Boulevard du Hainaut, Brussels.

Alpha.—*Oyster Shell Markings on Collodion Negatives.* May not these stains be the result of working with your new bath insufficiently saturated with brom-iodide of silver? Leave a coated plate in the bath all night, or shake up with a little of the same collodion and filter; it would then probably work satisfactorily.

Mr. Henry Flather is requested to make known his present address for the purpose of enabling a correspondent to communicate with him.

L. T.—*Prints Mounted in Optical Contact.* You will find the method described by Mr. Edward Dunmore in his article on "Finishing Photographs," which appeared in the News of February 17th, 1888. If at any time cracks appear, the picture must be stripped off and remounted; but flaws at the edges may often be repaired with hot gelatine.

W. J. F.—*Diazotype Printing.* This is merely another name for the primuline process of Messrs. Green, Cross, and Bevan, which has been several times referred to and described in our last volume. See page 707, September 12th, 1890, for the author's original communication.

M. P.—*Relative Cost.* For the smaller sizes, platinotype prints are charged at about double the price of silver prints, but with the whole plate and larger sizes the cost is usually more favourable than this to the platinum; the relative expense is then only four to three, instead of two to one.

Afric.—*Kaffir Types.* A small-framed collection of Dr. Mann's studies of South African natives is to be seen in the Ethnological Department of the British Museum, near Dr. Lindt's series illustrative of the inhabitants of New Guinea.

R. M.—*Decomposition of Chloride of Silver by Light.* At a meeting of the Chemical Society on the 7th inst., Mr. Arthur Richardson, of University College, Bristol, described experiments on this subject, which led him to conclude that the darkened silver compound is of the nature of a sub-chloride rather than an oxychloride. When exposed to sunshine under water oxygen and ozone are evolved, both chlorine and hydrochloric acid being found in solution; but with a larger volume of water *no* free chlorine can be detected. (See article on page 387.)

Colonel Waterhouse.—*Thio-carbamide.* See the report of Dr. Emerson Reynolds' researches making reference to your employment of this body for securing direct positive photographs or reversals. As the result of the Professor's study of some new addition compounds of thio-carbamide, its constitution is held to be unsymmetrical—that is, having a structure represented by $HN : C (SH) NH_2$, instead of the simpler formula $CS(NH_2)_2$. The paper was read on the 7th inst. at the Chemical Society.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1708.—*May* 29, 1891.

CONTENTS.



## SUGGESTED BY SOME RECENT EXHIBITIONS.
## II.

BY H. P. ROBINSON.

THE Gloucester, like the Liverpool Exhibition, had the aid of an energetic band of workers, headed by the president, Mr. W. B. Wood, and also the advantage of an excellent "send-off" in Mr. Lange, the president of the Liverpool Association, who is ever willing to help others, and who opened the show with his admirable lantern lecture on Iceland.

The chief lesson of Gloucester was that amateurs should more carefully study the published conditions. In one case a silver medal was awarded to an amateur, subject to a condition which stated that all the work, from the negative to the printing, should be done by the exhibitor. The work, in this case, was so very remarkable and so like that produced by a well-known firm for the trade, that the judges took the liberty of doubting. The result was that the exhibitor claimed doing all the work *with the exception of the negative!*

It is time much more stringent conditions were made touching the exhibitor being the producer. It sometimes happens that medals are taken by men who could not develop a plate, which is an artistic, if not legal, fraud. If men won't be honest for the love of honesty, they must be made so by Act of Parliament. Take an illustration from another art. Let anyone who is ambitious of artistic distinction buy a picture of a painter and send it to the Royal Academy as his own, and see what would happen. Until we can arrive at some sense of propriety in these matters, the respectability of the art is hopeless.

The necessity of studying the conditions carefully was also shown at Liverpool, where a very hard case occurred. It was in the portrait class. The condition was that a set of four portraits should be sent in competition, and one set was so good as to leave no doubt as to who should have the first medal, but one or two of the judges thought they had seen one of the portraits at a previous exhibition. The exhibitor was telegraphed to, and replied that he had not carefully noted the conditions, and so lost the medal. But, let it be noted, the disqualified portrait was one of the gems of the exhibition, and yet the strict rule should have excluded it.

The mention of portraiture reminds me that some exhibitors have a curiously wide idea of what constitutes a portrait, and send anything that they think will be near enough to beguile the judges. I have seen two classes hanging side by side, the one for genre, the other for portraiture, by one exhibitor, and have not been able to see the difference in class between the exhibits. The same difficulty of classification is found in other departments, especially the scientific. There was a famous example of this at Liverpool.

The delightfully artistic pictures of the Countess Loredana da Porto Bonin, which so surprised us all, were classed as "scientific," as though they were the results of a process rather than of an artistic mind and skilful use of materials. It is time we separated the science from the art of photography. There was no more science in these exquisite pictures than in the average photograph, but there was a great deal more art. I spent some hours over them, returning to them time after time during several days, yet I forget how they were done. I don't seem to remember the flash-light; I could not say whether they were printed on albumenised or matt surface; I only remember the art, the invention, the direct way in which the stories were told, the composition, and expression. If all this was the result of science, then everybody could do it, for the results of science are facts, and can be stated. Flash-light pictures are common now, but there are none like these Italian pictures. History repeats itself, or very nearly, and attributing these pictures to science runs parallel with the endeavour to find out years ago the secret of Adam Salomon's success by analysing the composition of the encaustic paste with which he polished his prints.

In the instantaneous classes similar mistakes are made, and injustice is often done. There should be a very distinct difference made between objects in motion and snap-shot pictures of objects that, although they require a quick exposure, such as a yacht sailing slowly, yet present no such difficulties as acrobats pursuing their vocation or athletes racing. I would abolish these classes altogether, for there is little wonder to be got out of instantaneity now, and there is nothing else left; but, as long as they exist, they should be kept distinct. This separation should be the work of the managers, or, if left to the competitors, work entered in a wrong class should be disqualified. It should not be left to the judges to sort them out.

Is it not time the column for particulars of process was omitted from the forms sent to be filled up by intending exhibitors? Nobody could welcome processes more than I do in an exhibition, especially if they are new, but I do object to all photographs being exhibited as specimens of some particular process. I always now fill up the column with the words "not exhibited as specimens of a process," and, if other exhibitors would do the same, something would be done towards removing the absurdity. A painter is not compelled to declare that his picture is painted in oils, or that it is varnished. If, instead of the process column, one could be inserted in which the exhibitor could declare that the exhibit was his own work, much would be done to purify the art from artistic immorality and commercial pretenders. I notice that the form of the exhibition of the United Amateur Clubs in America has a column to "state whether negative was developed by the exhibitor," and another to "state whether positive is work of exhibitor," which is good as far as it goes, especially if they were followed up by expulsion of the picture if not truly answered in the affirmative; but then the same form contains degrading questions as to lens, developer, printing process, and even the "make or brand of plate," a method of gratuitous (or otherwise) advertisement we should never think of in England.

If a photographer prefers to supplement his exhibit by an account of the lens, stop, modification of the developer, &c., he need not be prevented; but if, as in this case, he insists on exhibiting his photograph as the result of the process, it should be relegated to the scientific division of the exhibition.

In some conditions there is a clause to the effect that exhibitors wishing to compete with the same subject in more than one class must send separate copies for each class. This is very objectionable. Why should space be occupied by, and who wants to be troubled with, duplicates? Certainly not the outside public—nor, may I add, the judges.

There are a couple of lessons to be got out of the Crystal Palace Exhibition. Mention of the pictures of the Countess Loredana reminds us that when pictures are advertised and paragraphed as secured for an exhibition, there should be no doubt as to their appearing; and if, unfortunately, it is found impossible to secure them, the failure should be announced as prominently as the previous advertisement. I have heard of several people making journeys to the Crystal Palace for the sole purpose of seeing these now famous photographs, and being disappointed that they "had not arrived from Liverpool," or were "delayed on the way." I have heard since that they never went astray, but, as originally intended, were returned to the owner immediately on the close of the Liverpool Exhibition.

The other lesson which some of the contributions suggested, is that something must be done to suppress the barefaced plagiarism that is constantly occurring. I gather the following little history from the most authentic source.

One of our most prominent and successful amateurs—we will call him A—conceives a subject, finds and educates his models, collects accessories, and makes a fine picture. While he is at work taking the negative, another amateur, B, who has followed, watches the operation, and takes notice. When A leaves the district, B looks up the models, hires them, and even gets possession of some of the accessories, which A has left behind for use on a future occasion. This plagiarism—to call it nothing worse—is repeated, and the negatives are sold by the amateur to C. D. & Co., who are not photographers, but the proprietors of the photographic business of E. & Co., which they have recently purchased, and the pictures are eventually exhibited at the Crystal Palace as the work of E. & Co.

In this one transaction we have a bit of everything calculated to degrade the art. Yet I believe that it is all—except perhaps in the case of B, and he may have a dull sense of its not being illegal—done innocently. There can be no question whatever that the purchasers of the negatives are men of the highest respectability, who would not lend themselves to anything doubtful if they knew it, and who have a healthy horror of piracy; it is the want of sense of what is right as well as legal, and the regarding everything as a matter of business, that is the root of the evil.

In contrast with our own exhibitions, we have that recently held in Vienna, arranged on the best ideal lines, but for notice of which I have little space. The intention here, again, was excellent, but there seem to have been a few curiosities in connection with it. It was formed on the lines that photography is a fine art, and all who doubted this great fact should have abstained from exhibiting; yet among the contributors I see the name of one who has very recently abjured photography as an art. The jurors were all artists, but only one of them, Fritz Luckhardt, is a photographer as well. It would be interesting to know if the others knew anything of the special art they were judging. A point much to be commended was, that out of 4,000 contributions, 3,400 were rejected, leaving, doubtless, still a few hundreds that should have joined the majority. There was one photograph admitted that should certainly have been rejected. Is it true, or is it only a joke, that one contributor sent in nearly 300 photographs, and had one only accepted? Surely this was bad judging, for if one only in 300 was good, that one must have been a fluke, and the producer would get for a fluke an exhibition diploma equal to the best.

## APPARATUS FOR TESTING THE SPEED OF INSTANTANEOUS SHUTTERS AND MAGNESIUM FLASH-LIGHTS.*

BY HANS H. BAYER.

It falls now-a-days to the lot of every photographer, whether professional or amateur, to work occasionally with an instantaneous shutter. In order to obtain a really clear picture of any object in motion, it is necessary to know beforehand whether the speed of the instantaneous shutter is equal to the speed of movement of the object. Many people will therefore wish to ascertain the speed of their shutters. Now, there are several ways in which the speed of a shutter may be decided; and we can class them into two large groups. In the first, falling bodies are used; and they are photographed during motion by means of the shutter. For instance, sometimes a long black-board is employed, on which a centimetre measure is marked in white. A shining metal ball is held on the top mark of the measure, and then dropped. During the fall, an assistant works the instantaneous shutter. A picture is obtained which reproduces the scale, but on it will be found a streak of light, and from its length and its distance from the top mark of the scale, the length of the exposure may be reckoned by the help of known formulæ. This method, originated by La Baume-Pluvinel, was accepted by the Paris Photographical Congress. It is, however, of very little use in testing very rapidly-working shutters.

The second method is by means of the ascertained speed of shining bodies moving in a circular direction. Such an apparatus has been constructed by Professor J. M. Eder; it consists of a heavy wheel of dark wood,

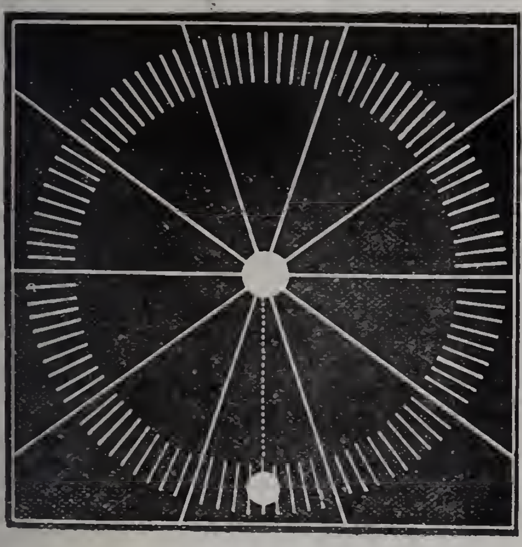


Fig. 1.—Front, with Pointer at rest.

which turns easily, and causes the stroke of a bell to sound with every turn. In the centre-point, as well as in the periphery, a silver-plated half-ball is fixed. An assistant turns the wheel till the strokes of the bell correspond in time to the ticking of a second-pendulum of a clock. The moment this speed is attained, the photograph must be taken. The picture obtained will represent a light spot on an arc of a circle, and from these two the length of the arc and the speed of the shutter may be reckoned.

* A communication to the Vienna Photographic Society.

I have now modified this apparatus. I use a black-board on which a wheel with one hundred white divisions is marked. In front of it a nickle-plated metal ball, which is attached to an arm, moves. This is turned by means of a handle at the back. With every complete revolution, a little spring on a disc with large teeth cut out of it gives

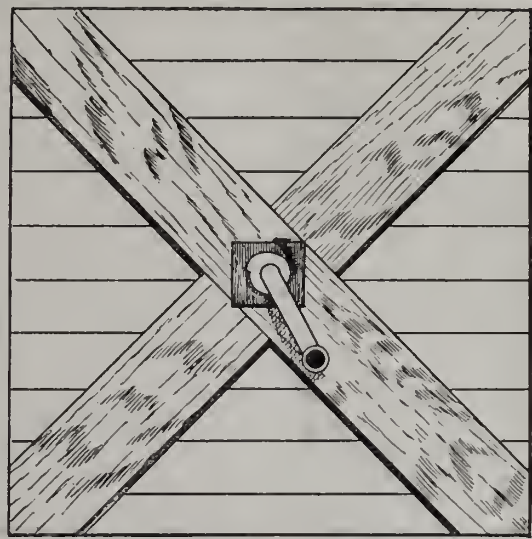


Fig. 2.—Back, with Handle and Signal Apparatus.

a clear note. This apparatus is placed in front of the camera, and an assistant then begins to turn the handle. In a short time the ball acquires an impetus, and it is then possible to make a perfectly even revolution, though the handle be turned slowly. The quicker the instantaneous shutter works, the quicker it must be turned, in order to get accurate results. By counting the seconds, one, two, or three turns a second can easily be made, as every turn is marked by the note of the catching spring. When the desired speed is attained the instantaneous shutter must be worked; or, if testing the speed of magnesium flash-lights, the apparatus put in action.

The picture thus obtained consists of a representation of the board with the white divided circle, and on the latter will be found a white, sharply-defined arc. The length of the arc will be measured on the circle, and must be divided by one, two, or three, according to whether one has made one, two, or three turns per second during the exposure. For instance, if the arc is the length of six divisions, and one turn per second has been made, it gives ·06 or about $\frac{1}{16}$ of a second; if two turns have been made, it will be ·03 or about $\frac{1}{33}$ of a second; by three turns it will become ·02 or $\frac{1}{50}$. The great advantage of this apparatus over other methods is, that any more complicated reckoning is done away with; a glance at the negative obtained is sufficient for ascertaining immediately the exact speed of the instantaneous shutter. The apparatus must be handled with intelligence to obtain accurate results. In the tests which I have made it has given uniform results with the same shutter with mathematical precision.

Camera Club.—The programme on Thursday last included a paper contributed by M. Leon Vidal; also a paper by Prof. W. K. Burton on a new emulsion method for matt-surface silver paper, with illustrations. During the same evening Mr. Woodward showed Schoppen's method of viewing lantern slides stereoscopically.

## DR. J. M. EDER'S CRITICAL EXAMINATION OF C. SCHIENDL'S "HISTORY OF PHOTOGRAPHY."*

BY C. SCHIENDL.

On page 153 (Photo. News, p. 202) Her Eder remarks: "In the first place, one ought not to set down the discoverer Legray as a 'phrase-maker,' when one is not in the position to affirm that Liebig actually was the first to recommend the application of pyrogallic acid to the development of photographic pictures. Regnault made the discovery independently of Liebig, and they acted, as nearly as possible, simultaneously. Without doubt, however, Regnault first brought this developer into practical use. Schiendl owes to us the information that Liebig was before Regnault." This absolute misinterpretation of my statement is rectified as follows:—If I speak of a phrase which Legray has used by describing all the said and other discoveries as clearly French, it is not to be concluded in the least that I describe Legray as a phrase-maker, which would involve an insult, whilst my description will certainly not be held as such by any reasonable thinker. Further, Herr Eder owes to us the information that Regnault made the publication of pyro developers independently of Liebig, and this statement (of the contrary) is simply his own opinion proved by nothing. My statement, however, is supported by Liebig's own sentence, which I quote, and, therefore, if the Frenchman Legray proclaims his countryman Regnault as the discoverer, I, as a German, have at least the same right to reclaim the honour for my countryman Liebig, proved by his own statement, and if Dr. Eder believes himself obliged to take the name of "poor late Legray" under his protection against me—which is certainly not necessary, as I have rendered him all due honour in my work—I can only remark in return that the name of the great Justus Liebig stands far too high for his everlasting renown to be cut short by Dr. Jos. Maria Eder.

On page 154 (Photo. News, 202) the same critic makes the following remark:—"On page 169 of his 'History,' Herr Schiendl asserts that H. W. Vogel published in May, 1884, his colour-sensitive collodion process on the foundation of Schultz-Sellack's observations, published in the year 1871 . . . We now meet with the very astonishing fact that the sources on which Schiendl depends in no way contain one word that would justify his denial of the independence of Vogel's discoveries."

I have to reply to this, that it is not a true statement in which Dr. Eder declares that I deny the discovery of Vogel of colour-sensitive plates, for I have especially set forth, on page 297, that Dr. H. W. Vogel (in the year 1873) was the first who sought to advance the sensitiveness of bromide of silver, with the addition of coralline and aniline-green, to the less refrangible rays of the spectrum. If Herr Eder nevertheless adds further, "I bring forward this example in order to show in what an astonishing manner Herr Schiendl treats weighty historical questions, and how the confiding reader may be led to suppose that his statements have historical basis, whilst a close examination makes it evident that the quotations of Schiendl are wrongly employed," I must reply to it that this remark of Eder's contains an absolute and conscious untruth, as I have made no quotations, and therefore could have used nothing wrongly; whilst that which Herr Eder arbitrarily selects from my book was made public by Vogel in 1884, and I mentioned it in my chapter about emulsions as practical instruction; whilst I could only mention in the scientific part of the year 1873 his practically much older discovery.

My supposition that Vogel made his, in any case, independent discovery on the foundation of the researches of Schultz-Sellack in no way lacks foundation, as Schultz-Sellack was the first who showed that bromide of silver could be made sensitive, by certain additions, especially to the less refrangible rays, even if he did not also mention something of a colouring material, which latter merit of Dr. Vogel's I have also duly recognised in my "History of Photography."

A further perversion of my statement by Herr Eder is found on page 155 (Photo. News, 202): "On page 66 he places himself on the summit of those experimentalists who sought to increase the keeping properties of wet collodion plates by the use of hygroscopic salts, and says that he first made these researches in the year 1853, and that later Spiller and Crooks published the process. . . . It appears to me a very unjust thing that, on the ground of a statement without evidence, Schiendl should place himself before Spiller and Crooks, and seek thereby to lessen the credit of the latter for the priority of this certainly rather unimportant discovery."

The entire absurdity of the statement that I wish to establish myself as the discoverer of a "certainly rather unimportant discovery," and the malicious distortion of the facts, is proved in the text, wherein only the remark is found that this process, published by Spiller and Crooks, had no future, and was also tried by me afterwards in the year 1873, but with no result. Therefore, if I speak of an unsuccessful research, no thoughtful person will entertain the supposition that I aim at pushing myself forward as the discoverer of an unsuccessful and worthless process, to the disadvantage of others. If I had maintained such a purpose about a valuable process—oxalate developer, for instance—the rectitude of a certain reproach could not be gainsaid.

In conclusion, the same critic writes on page 155 (202, Photographic News), as follows:—"The description of the history of the camera obscura in the book before us is wrong, as far as concerns Porta. On this, however, I will no longer dwell, except to mention it as a warning to those who might be depending upon Schiendl's statements."

Dr. Eder consequently asserts here simply that my statement is false without any justification, which assertion, however, has quite as much worth as his foregoing proofs, which have proved quite untenable. The warning against the belief in the thoroughness of my work can only follow the purpose of preventing the photographic public from a further perusal, in order that it may not arrive at the facts, which, in consequence of my dates and quotations—which, although suspected by him, are nevertheless quite exact—might be very uncomfortable for him.

* Concluded from page 367.

---

Photographic Club.—Subject for June 3rd, "Platinotype Processes"; June 10th, "Combination Printing." Outing, May 30th, Hale End; train from Liverpool Street at 2.32.

Mr. Fallowfield sends us a specimen of "Miall's perfect sheath" for quarter-plates, which certainly possesses many advantages over the kind in common use. So many of the hand-cameras now made require that their plates should be held in sheaths, that the new pattern is likely to have an extensive sale. The plate is held at the bottom by a groove, and two movable clips at the top hold it firmly in position. With this aid the operation of charging a dozen sheaths need not occupy more than one minute.

## CAMERA CLUB SOIREE.

On Monday last the Camera Club gave a house-warming in the shape of a most enjoyable soirée. The handsome premises were decorated with flowers, and looked as gay as possible when filled. The company, including many ladies, assembled shortly after eight o'clock.

The entertainment provided by the committee included a capital concert in the large club room from 8.30 to 9.30 p.m., and from 10 to 11 p.m.; a lantern exhibition, lasting from 9.30 to 10 p.m.; an exhibition of photographs by members; an exhibition of mechanical work by members in the lathe room (ornamental turning in ivory, mechanical models, &c.); the phonograph in the library; microscopes, stereoscopes, the thaumatrope (Ottomar Anschutz, for reproducing movements of animals, &c., taken by photography), in the billiard room; Chladni's sound figures and Newton's coloured discs, &c., in the studio; and a clever exhibition of sleight-of-hand by Mr. F. R. Broadbridge.

It will be seen from this programme, which was exceedingly well carried out in every particular, that the whole of the Club premises were thrown open to the visitors. A soirée is too often a very dreary affair, and especially those which are mixed up with anything in the scientific way; but in this case the science was so wisely leavened with the amusing that the evening was a pronounced success. Everyone seemed sorry when the time came to go home.

## EASTMAN PHOTOGRAPHIC COMPANY.

An extraordinary general meeting of the Eastman Photographic Materials Company, Limited, was held yesterday at Winchester House, Colonel J. T. Griffin presiding.

The Chairman stated that the business of the Company had altogether outgrown present means of carrying it on. Its growth, in fact, had been in many respects far beyond the expectations of most sanguine friends. At the last annual meeting the question was asked when the balance of the unpaid capital would be called up. The answer was, "Not until it is required." At that moment the Company had sufficient funds for carrying on its work; but since then the volume of business had so enormously increased that the directors found the capital largely locked up in outstanding accounts. More than that, the building at Harrow was now completed, and within a few weeks would be in a position to manufacture the larger part of the Company's goods. Under those circumstances, the capital was found to be not quite sufficient for trading purposes, and, therefore, the directors came to the conclusion to ask the shareholders' authority for increasing the capital from £150,000 to £200,000. They wanted, at present, only £10,000 or £15,000; and, as showing their confidence in the business being transacted in Europe, the parent company had offered to take up £10,000. The Company at the present moment owed the parent company about £8,000 for goods received, and upon that sum they were obliged to pay interest. The directors wished to relieve themselves of that obligation, and to become their own masters. He might add that the volume of business had increased 50 per cent. during the past three months, whilst orders were still coming in to such an extent that they could not be duly executed. It was also in contemplation to establish branches of the Company at Paris, Berlin, and other places on the Continent, all of which work would require additional capital, inasmuch as it was necessary to keep large stocks at the various depôts.

Mr. J. Spiller (shareholder) moved:—"That the capital of the Company be increased to £200,000 by the creation of 5,000 new ordinary shares of £10 each."

Mr. G. Jupp seconded the motion.

In reply to questions, the Chairman said the new shares would be issued at par to the shareholders on this side. If any were not allotted, they would be offered to the parent company, whose shares sold, when they were sold, at a very heavy premium.

The motion was agreed to.

On the motion of Colonel Allix, seconded by Mr. Jupp, it was resolved:—"That such new shares shall be issued at such times, in such manner, upon such terms and conditions, as the directors shall from time to time determine."

A vote of thanks to the chairman concluded the proceedings.

## SKIES IN LANDSCAPES.

BY XANTHUS SMITH.

The beauty of landscape scenes is so much enhanced, when there is sky appearing, by the introduction of suitable clouds, that we wonder more pains are not taken to introduce agreeable sky effects in photographic landscape views.

Painters set great store upon varied effects which may be attained in the skies of their pictures, independently of the colouring; the mere design and massing of light and dark, which are fully attainable in photography, are matters of much solicitude with them. A brilliant mass of light in a sky gives wonderful life and interest to a picture, and broad masses of shadow are often resorted to in order to unite the sky with the darks of the foreground, and to give support to dark features rising up and cutting upon the sky.

Of course in the photographic art the scope is extremely limited, as compared with that of the painter, for giving play to the fancy in choosing skies and grouping clouds as they should be; but in the simpler forms of composition and effect photographers might enhance the beauty immensely of some of their more careful and successful landscape scenes by the introduction of clouds. Probably the most usual mode in practice for the addition of skies to landscapes is that of printing them in from negatives previously taken of fine skies; but I am not going to urge this mode of obtaining what is wanted, because it is open to several objections, the principal one being that a sky which photographs well is so round and bold in character that it is apt to take too much consequence in the picture, and it is so important that the lighting of the clouds should precisely accord with that of the landscape, that it would require a great stock of cloud negatives from which to secure what might be required. In printing in, also, all opportunity is lost of accentuating certain portions to give artistic effect, and I think, therefore, except, perhaps, in the case of open sea views, that it is much better to paint the sky upon the back of the negative, opportunity being afforded in following this mode to design a sky that will harmonize with the subject of the picture in every respect. The principal obstacle in the way of put-on skies is that it sometimes happens that the sky of the negative is so dense that nothing can be put upon it which will print; but a good negative should not be so dense in the sky, and in such case the only way would seem to be to omit clouds altogether, or print them in from sky negatives.

I have found the following the best mode of procedure for putting skies on negatives. In the first place, they should always be painted on the back or glass side, and the glass must be thoroughly cleaned and washed over with some liquid ox-gall; then, having mixed some "opaque" with water (I have often found beer to answer admirably), fill a good soft-bristle brush—preferably with a rounded end—with the mixture, and flow on your clouds. The negative should lie flat while the colour is being flowed on, and then taken up and held perpendicularly, more or less, and turned around, being watched by transmitted light the while, and the moist colour flowed in such a manner that the greatest amount, and consequently the most density, will be where the highest lights should come. This turning motion of the negative must be continued until the colour sets; and when the colour flows too thick towards one edge it should be laid flat for a little while, so that the latter may become somewhat diffused again. All this will probably appear very difficult of attainment to a novice in the art, but, like some other things, the sleight and confidence attained by some trials will soon bring the experimenter to a successful stage of progress. A great advantage in this mode is that the work is very quickly done—indeed, rapidity of procedure is a concomitant of success, and each failure can be removed in a moment and another attempt made, no injury to the negative resulting from any amount of attempts and failures upon its back. One point which is important is that the mixture of opaque when flowed on should be just of a proper consistency. If it be too thick it will not flow well, and will make the clouds too harsh and brilliant, unless, perhaps, when the sky of the negative is very dense, which will require a thick mixture. If the colour is used too dilute, there will not be sufficient density attained. A knowledge of this can only be attained by practice. It is also important that a large brush be used; one of about a half-inch in width is a good size for 4¼ by 6½ to 6½ by 8½ negatives, and I spoke of its being rounded because the rounded forms of clouds are better got than with a brush that is square on the end, the latter making the forms too angular.

When the sky becomes dry, as it should do in a few minutes, undesirable portions may be removed, and harshness softened, by wetting a camel's-hair or sable brush in clean water and squeezing it out flat, and with this delicately wiping off and shaping the forms, and modifying them to suit the taste.

The fancy can be allowed full scope in the matter of design. The entire range through flat, stratified, and full cumulus, to the most delicate, fleecy cirrus, is open to the aspirant to artistic success. He has nature, the great teacher, before him every day to study and to supply him with the very finest of material; but it must be remembered that grouping and simplicity of design are important elements of success in the addition of skies in pictures. It will not do to spatter our clouds all over the sky; they must be grouped, and large portions left free from them, and in repose, and a repetition of the same form many times over must be avoided. Such repetitions frequently occur in nature, but as these accidents destroy that variety which gives interest and pleasure, it is better to avoid them.—*American Journal of Photography.*

---

Cardiff Exhibition.—An arrangement has been made with the committee of the Glasgow Exhibition by which exhibitors desirous of competing at both exhibitions may have their pictures sent from Cardiff to Glasgow by through truck, carriage paid, to arrive at Glasgow in time for the judging on August 31st.

It is considered by F. Wilde, according to the *Photographic Journal*, that fat in the gelatine tends to produce fog in the dried film, and that treatment with alkalies and clarification with albumen does not remove this fat.

## TWO NOVELTIES.

Messrs. Marion and Co., of Soho Square, who are ever to the fore in discovering what is wanted by the modern photographer, have just introduced a couple of appliances which have not only the merit of novelty, but which pack up into such small space that one can take advantage of them without materially adding to his impedimenta. The first (fig. 1) is a lens shade made of thin metal, which can be readily attached to the camera front, and fixed at any angle which the position of the sun may require. Most photographers who have been in the habit of adapting their hat to this purpose, and have occasionally cut off a portion of their picture in doing so, will appreciate this simple device, which is both cheap and effective.

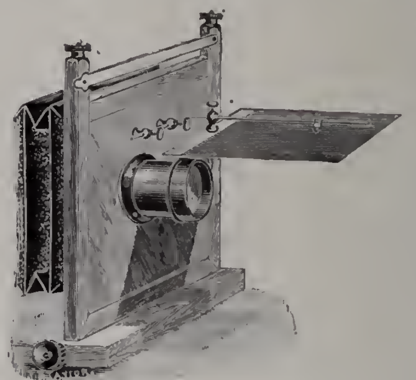


Fig. 1.—Marion's Lens-Shade.

The other appliance to which we call attention is Claringbull's portable changing bag and developing tent,

Fig. 2.—Claringbull's Portable Changing Bag and Developing Tent.

which is used as shown in fig. 2. When closed, the apparatus measures 26½ by 20 by 3 inches, but when opened out its depth is increased from 3 inches to 30. Its weight is 12 lbs. It will thus be seen that a large-sized plate can be developed in this portable dark-room, and there is no doubt that the apparatus will be particularly useful when a large number of negatives have to be taken in a limited time, and when the operator only possesses the normal number of dark slides. The tent is well ventilated, thoroughly light-tight, and provision is made for carrying off wastes during development.

## PHOTOGRAPHY IN GROTTOES AND CAVES.*

Interior photography is in general sufficiently difficult, but when we come to photograph the interior of caves the work becomes more difficult still, for here we have vast halls with sombre shades, the walls of which reflect little light, and where there is little or no relief. Many methods of artificial illumination may be employed in this work. They include :—1. The electric light; 2. The pyrotechnic composition known as Bengal light; 3. Magnesium ribbon lamp; 4. Chemical flash composition; 5. Magnesium powder without admixture. These different methods we will consider *seriatim*.

1. *The Electric Light*.—This will give the best results, but the necessary impedimenta, which is of the most cumbrous nature, cannot be introduced into the devious windings of many caves.

2. *Bengal Fire*.—This is the well known mixture of saltpetre, sulphur, and antimony sulphide, but its use ought to be forbidden, for the fumes given off discolour any stalactites which may be in its neighbourhood when fired. Moreover, the smoke so quickly dims the atmosphere that successive pictures cannot be taken in the same hall after its employment, to say nothing of the sulphurous fumes which render the air so irrespirable. These grave inconveniences almost forbid the use of this mixture, notwithstanding the white and brilliant flame which it affords.

3. *Magnesium Ribbon Lamp*.—With this apparatus it is possible to flood the surfaces to be photographed with light for several minutes, the amount of light being increased by a suitable reflector. MM. Gaupillat and Martel used this method last summer, but the results obtained were far from satisfactory, although the exposure was sometimes prolonged to as much as ten minutes. According to the information furnished by M. Martel, the inconveniences of this method are found in the inequality of the light, the length of exposure (during which other visitors are shut out), and more than all in the heavy smoke which forms a veil over the scene even while the exposure is being made.

4. *Chemical Flash Composition*.—These compositions are often of such an explosive character that it is hardly safe to handle them, for ignition may be brought about by simple percussion. A most dangerous accident might occur from a man while carrying a charge of this description, stumbling in his passage through the dark cave. Besides, the concussion of the explosion might displace loose blocks and boulders, and so tend to further disaster. We have also again here the risks from the irrespirable products of combustion.

5. *Magnesium Powder used alone*.—This we may consider as the best method of all, and in many cases the only practicable one. Magnesium dust is not explosive; it does not necessitate cumbrous apparatus, and it produces a flash so short in duration that figures can be introduced, by which the proportions of the cave can be gauged in the finished picture. The smoke in this case does not constitute any grave difficulty, for the little cloud produced during ignition is soon dissipated. I have made a series of experiments by the help of this agent, and the results being satisfactory, I have thought it well to bring them to the notice of the Society.

*Method of Procedure*.—The first difficulty was to produce a sufficient amount of light, the quantity of powder generally used for portraiture being much too little for the purpose in hand. It was necessary, too, to find a suitable apparatus. Dr. Regnard kindly showed me, in operation, the magnesium signal lamp invented by him, and it is this lamp which I employed in the experiments referred to, after I had somewhat modified it to fulfil the conditions which I thought desirable.

The lamp burns alcohol in a circular wick, and in the annular space thus formed is placed the tube for projecting the magnesium powder into the surrounding flame. The other end of this tube is carried to the outside of the apparatus, and furnished with a small funnel, by the aid of which the charge of magnesium is inserted into the tube. After lighting the wick, which should be sufficiently raised to give a flame two or three inches in height, you charge the tube, remove the funnel, and fix in its place an india-rubber tube attached to a bellows. Pressure upon this bellows brings about a complete and instantaneous combustion of the magnesium powder. Two grammes of magnesium are sufficient to give a beautiful flame of nearly two yards in height, and, after several experiments, this is the charge of powder which I find best to use. The results are only perfect with the most rapid of plates, and with an energetic developer. I have succeeded well with the *Lumiere* plates (blue label), and with the preparation known as the "Perfect" developer of M. Mercier. I may add here that the ordinary pneumatic ball will not give sufficient propulsive power with this lamp; the bellows is indispensable.

If a tube of larger diameter be employed (say of one centimetre), you may project a charge of four grammes of magnesium with each puff of the bellows, but the extremity of the tube where it meets the flame should be narrowed or choked to a slight extent. The lamp may be placed on the ground, but not directly in front of the camera for fear of fogging the negative, but at one side, and at a distance of about two yards from the camera-stand. The lens used should be of the rapid type, and one which will cover well with open aperture. Nadar's detective lens gave me good results. The placing of the camera, and the focussing, are the chief difficulties of subterranean photography. The apparatus once on its stand, you turn it in the required direction, but you can distinguish nothing on the focussing screen by the feeble light of the lanterns, and the focussing glass is of no use. But if the parts to be photographed are accessible, two men furnished with lanterns may be placed at either side, and then the image of the lanterns can themselves be focussed, forming the limit of view on either side of the focussing screen. It will also be a help if a graduated scale be fixed to the tailboard of the camera beforehand, so that the approximate focus can be obtained without viewing the image on the screen. Everything being ready, the plate is inserted and the lens is uncovered, the lanterns outside the field of view having no hurtful effect upon the plate; but any figures introduced should be posed before the cap of the lens is removed. By taking these precautions one is certain to obtain results quite as good as if full daylight had been available.

* A communication by M. J. Vallot to the French Photographic Society.

## Notes.

The *Journal of the Photographic Society of India* gives an obituary notice of the late Mr. Grimwood, one of the victims of the Manipur disaster, for that gentleman was a member of the Society. It would be interesting to know whether he carried a camera with him during this disastrous expedition, and whether, too, he had an opportunity of using it. It is reasonable to suppose that he would not leave his apparatus behind him when about to start upon an expedition so likely to yield photographs of a little known country. That camera and its belongings, if really carried to Manipur, will probably present a problem to the natives as to the use of such a contrivance which may remain for a long time unsolved.

But now-a-days the country must indeed be a wild one where the camera is not known. That its use is still a matter for conjecture in certain parts of Kentucky is evident from a telegram sent per Dalziel's agency which appeared on Tuesday last in the evening papers. According to this authority, a photographer lately came here to take some landscapes, and fell among thieves in the shape of "moonshiners," who are described as being half brigands and half illicit distillers. The poor photographer had no sooner put his head under the focussing-cloth to take his first picture than he was knocked over senseless, and the equally innocent camera—supposed to be some kind of gun—was knocked over too. The poor man when he recovered consciousness found himself in a cave, where he had been thrown—a supposed corpse—by the moonshiners, who fired on him directly he proceeded to show himself. Luckily he was not hit, and when he got a chance of explaining his mission to this inhospitable region, he was allowed to go his way, on promising not to reveal the locality of the cave in which he had been immured.

A notice is now prominently displayed in the Naval Exhibition to the effect that no person is allowed to photograph there, all rights being reserved. It is a sign of the times that such a notice should be necessary, and is evidently a hint to the users of detective cameras. But photography is represented at the exhibition all the same, and there is one stall entirely devoted to the products of the camera. These pictures have, we believe, been taken entirely by officers in the service, and the profit from their sale is to be devoted to a charitable purpose. Among them is a photograph of the two model ironclads in action on the lake, and the picture looks very like a real naval engagement.

There is a curious effect which is produced during the firing of heavy ordnance which is well seen in some of these photographs. We mean the gradual burning of the large cubes of powder which are not wholly consumed in the bore of the gun. These form strings of smoke independently of the main cloud caused by the explosion. We fancy that they are best seen when the gun is firing a blank charge, on which occasion, if such coarse powder is used, much of it is blown from the gun quite unconsumed. It will be remembered that at a recent naval review a yacht was much damaged from this cause, and the owner vented his righteous wrath in the usual British manner—the inevitable letter to the *Times*.

The new Copyright Bill seeks to make it a statutory offence to exhibit the portrait of a person without his or her leave, but in the meantime there is nothing to prevent a photographer exhibiting a photograph of a sitter, or a painter introducing the portraits of well-known individuals into a picture. They order these things better in France. A portrait across the Channel can be made the ground of an action for libel. For fear of after consequences, M. Béraud, the painter of the most talked about picture in the Champ de Mars Salon, at the final moment previous to exhibiting, added beards, moustaches, and mutton-chop whiskers to the fifteen nobilities who comprise his "Chez le Parisien." The ignorant Englishman might be tempted to imagine these additions would intensify the libel, if any existed, but evidently in Paris they think differently.

That there is nothing new under the sun photography is continually showing. When a society journal says "a new and decidedly clever departure is the cabinet cameos which give four different views of a face in one photograph," the memory at once goes back twenty years, when the cameo carte sized portraits had a brief and a not particularly merry existence. Somehow, the cameo portrait never "caught on," but it may have been before its time. It will be interesting to see if the same thing in cabinets will be any more successful. Unfortunately, no matter what the size may be, the quadruple portrait is always open to one drawback—the difficulty of getting four views of one face which are equally pleasing. The general effect used to be too often spoilt by one of the portraits being unfavourable in its aspect or expression.

A statue of "Sandow," which was known to many by reason of the excellent photographs which had been made from it, and distributed, has not been seen in the Academy. The question is asked why, as, according to the *Globe*, some artists have gone so far as to say that the statue expressed the most perfect representation of the human form that had ever been known. Perhaps the hanging committee shook their heads at admitting the counterfeit presentment of a music hall athlete. If this be the reason, they have evidently forgotten a precedent in the shape of the bust of Leotard, who revolutionised acrobatism a quarter of a century ago. *Apropos*, an interesting comparison would be instituted if Sandow were photographed in exactly the same pose as his statue, so as to find out how far the sculptor had idealised the human form.

The writer of a series of articles on photography in the *Weekly Scotsman* denounces the tripod. "It looks," he says, "simple and harmless, but neverthcrless in the wickedness of its nature it is excelled only by the flail." This is perfectly true; but is not everything connected with photography at times afflicted with a perversity which drives one to distraction? Why is it, in spite of the utmost care, some plates persist in being exposed twice over, while others are not exposed at all because you have forgotten to draw the slide? How comes it that it is always the most valuable negative which gets cracked? Who can explain the reason that if you do leave a camera screw at home it is invariably the one you cannot do without? These are only a few of the mysteries the solution of which torments sometimes the most experienced photographer.

## PHOTOGRAPHIC FRAUD.*

BY JAMES MEW.

In 1869 an ingenious deception lightened the purses of many of the people of New York, a city claiming a reputation—which, in the present case, it seems not to have deserved—of exceptional *'cuteness* or intelligence. A photographer of that time appears to have monopolised the sharpness of the general community. By a method about which the photographic schoolboy would not require to be enlightened, this immoral artist secured a lucrative business. By appealing to the superstition of his customers, he flourished like a green bay tree. To such a one of his sitters as seemed to that photographer a suitable subject, he presented that sitter's portrait. The sitter, looking earnestly on his own likeness, discovered something more. Behind him, in the dim background, stood a weird figure, a shadowy presentment, an uncanny shape—in a word, a ghost. This ghost was explained as the occasion required. Now it was a guardian angel, now a malignant demon, now a ministering spirit of a wife deceased, now a hovering wraith of a mischievous but, happily, long dead and gone maiden aunt. These so-called *spirit photographs* obtained a remarkable notoriety. Though now themselves as extinct as those of whom they claimed to be the shadows and representatives, they brought no small gain unto the craftsmen who dealt in them, both in New York, in London, and elsewhere. It is remarkable that the American phographer who invented them was held blameless before the judgment seat. The magistrate appears himself to have hankered after the supernatural. The reason of the faith that was in him was not at all affected by an irreverent remark of the counsel for the prosecution, who asked whether, with all appliances and means to boot, the prisoner could have produced a carte of the ghost of Samuel. Though, at the best, the photograph of a ghost would be, as the flippant might say, but a ghost of a photograph, it would be interesting to obtain, say, a cabinet of Auguste Comte, a negative of a positivist.

But the most important plant of photographic fraud is that bearing cheques and bank notes upon its branches. Before photographic engraving arts had been invented, before the collodion process was born, it was found possible, by the agency of calotypy—the well-known method discovered by Fox Talbot of obtaining a beautiful impression, from which this scion of photography derived its name—to produce counterfeit notes and cheques which not unfrequently deceived the very elect, escaping without challenge not only from the trained inspection of the bank cashiers, but also from that of the argus-eyed adepts hired by the bank authorities for the express purpose of detecting imposture.

In 1863, a person of doubtful name and nationality—seeing that the papers of the time describe him as Regnoldi an Italian, as Renaldi a Swiss, and as Rinaldi a foreigner, with many other variations of addition—was charged with an intent to defraud the Emperor of Austria by the photographic imitation of a one gulden Austrian note. A certain MacGuire, or McGrire, or McQuire—for the leprosy of inaccuracy which appears to infest printed matter clung to his name also—was the photographer employed by Regnoldi. This case, from an ingenuity of pleading in which the photographic world would be little interested, became quite a *cause célèbre*. The counsel for the prosecution spoke of this photographic portrait of an Austrian note on glass as the first attempt to forge bank notes by photographic aid. Possibly his statement was correct; but so much cannot be said in favour of some of the observations of the counsel for the prisoner, a gentleman who amazed his own client and photographers generally by speaking of the glass positive of the bank note as an "evanescent shadow requiring to be transferred to a negative."

In 1865 two Frenchmen were charged with forging a Russian bank note. These ingenious gentlemen had managed to obtain *facsimiles* by means of photography, which were subsequently transferred to plates for engraving. In 1873 a photographer who had established himself in a place called Usti Monvediza, a small town in the Cossack steppes of Southern Russia, distinguished himself by a sumptuous living and a lordly style of expenditure for which the number of portraits taken in his studio utterly failed to account. In an evil hour for himself, the artist decided upon taking a partner in his business. Acquaintance begat friendship, and friendship begat intimacy. The partner was trusted with that photographer's secrets. The usual result followed—the confiding photographer was betrayed. The police came down like a wolf on the fold, and discovered to an inquisitive world that the Usti Monvediza artist took other portraits than those of the inhabitants of that place and its neighbourhood.

In the *Melbourne Argus* of 1874 is immortalized the name of one Perry, who defied the intervention of colour as a preventive of forgery—in other words, as a check to the imitation of cheques. From him the editor of the *Argus* received a copy of a bank note, executed, according to Mr. Perry, with ingredients not likely to be discovered by any person unless his studies had been specially directed to the science of chromo-photography. The publication of the process by which the colour difficulty was set at naught was withholden by the Melbourne photographer on the ground that it was fraught with danger to bankers and the general public. The *Melbourne Argus* editor described the document sent to him as a photograph on a reduced scale of a union bank note—a negative of a note printed in blue and other colours—and a faithful copy. To the dismay of such honest folk as fancied that the colour of their notes constituted for them a fortress of impregnable security, Perry maintained that notes could be reproduced in any colour or colours, and that the use of blue ink in note printing was not, as had been hitherto fondly imagined, any security against photographic forgery.

Indeed, in the very next year the blue bank notes of the Bank of France were extensively photographed, and in 1879 forgeries were attempted in the black-and-white notes of the Bank of England. In these all minute details, including, of course, the secret marks, and the highly finished vignette in the left-hand corner which so many love to look upon so well, were of course accurately copied. The sensitive plate may be said to see better than any human eyes, and divergencies of form, only perceptible under the microscope, were faithfully represented. But the water mark constituted a difficulty which photographic ingenuity misapplied was unable to surmount.

In cheques, the very small letters sometimes used are commonly believed to be a safeguard against imitations, a belief which an elementary knowledge of photography would at once and for ever dispel. The colour of the cheque is also but a poor defence. It has even been

* Concluded from page 385.

maintained that the pigment is an aid to forgery, as helping to conceal errors and erasures. But photography the bane is also photography the antidote. The camera, which has been used to falsify, may be used also to detect, and the best way to determine whether a document has been forged by the aid of photography is to ask photography to examine it. In other than photographic forgeries photography is of service. In the case of a cheque for one hundred and five francs, the words and figures had been effaced, and five thousand francs substituted. The camera showed the deceit. On the photographic film were found plainly depicted the original figures and words.

## AUTOMATIC PHOTOGRAPHY.

In consequence of our article on the above subject which appeared last week, we received a letter from the managing director of the Company to which the automatic machines belong, combating many of our statements. This letter also contained a courteous invitation to visit the headquarters of the Company at Shepherd's Bush, and to try the machine for ourselves—in fact, to do what we liked with it, free from the distractions of Hampstead, the frivolities of the Naval Exhibition, and "far from the madding crowd." We would have chosen a reasonably fine day for our visit had fine days been available in this (so-called) "merry, merry month of May." But, as the American humourist truly pointed out long ago, we have no *weather* in this old country, only samples. The particular sample at hand on the occasion of our visit to Shepherd's Bush was a dull and wet one, and so, all unwittingly, it was our fate to put the automatic machine through its paces under most unfavourable conditions; indeed, it was actually raining all the time that we were having our portraits taken. These portraits, we may say at once, were excellent pennyworths, and as different to those which formed the subject of our comments last week as they possibly could be.

In order that our readers may understand how such different results were attained with the same apparatus, it will be necessary to give a brief description of the working parts of the automatic machine. In the first place, there is a store of sensitive plates which, by suitable mechanism, started by dropping a penny in the slot, are detached one by one, and are brought under the influence of the lens. The plates are made of thin enamelled iron, are coated with a collodion emulsion, and will retain their sensitiveness for about two years. The exposure can be made quicker or slower by a slight alteration of the mechanism, and the lens is furnished with an iris diaphragm, so that the aperture can be altered to suit the light available. We need hardly say that such adjustments cannot be made automatically, but require experienced attention. After exposure, the little plate falls back into a cradle, which travels in a horizontal circle over three baths. The cradle is made of perforated metal, and, by a clever arrangement, is made to dip into each bath one after the other. The first contains the developer (hydrokinone), the second the fixer (hypo), and the third plain water. After immersion in this last bath, the little cradle gives up its burden to an inclined plane, and the now completed portrait is shot out of the machine ready for its owner. The contrivance is wonderfully ingenious, and does its work well considering that it has no brains.

But, it will be asked, how comes it that a particular machine at Shepherd's Bush should work so well on this rainy day, while those to which we referred last week gave, under better conditions, such sorry results?

The reasons for this discrepancy are not far to seek. In the first place, many of the public machines are undoubtedly very badly placed with regard to light. Indeed, it becomes a question whether each machine should not, to attain anything like perfection, be capable of being turned, so that its position may alter with that of the sun. Again, many are pitched so that the model has sky for a background, and a good result under such conditions is next to impossible. It would be to the ultimate gain of the Company if they refused to allow one of their machines to be used unless it were placed in such a position that the light could have ready access to a person standing in front of it.

But the principal difficulty with which the promoters of these machines have to cope is one which is felt more or less in every phase of life, namely, the obtaining of reliable servants who possess a little of that very uncommon attribute miscalled common sense. It is easy enough to point out to a man that the three liquids with which the baths are charged must not be mixed together, but unless he knows something about photography, he will never believe that a hypo-defiled finger can have any harmful effect upon the developing bath, nor will he realise that an occasional change of solutions is any more necessary to the machine than an occasional wash is in the case of his own person. In a word, the average man available for this kind of work is too much of a machine himself to succeed with the apparatus, and the conjunction becomes at once a case of the blind leading the blind. Is it likely that such a man can appreciate the difference in the amount of available light which manifests itself from hour to hour, and from day to day, in such a climate as ours, so that he may be capable of regulating the exposure accordingly? Is it likely, too, that he will master the *raison d'être* of the iris diaphragm?

We need hardly say that our strictures on the performance of the machines were written in no unkind spirit, but we cannot say that they were not true. We think that on reflection the Company will themselves admit that what we wrote was fair comment upon a matter of public interest, and certainly not a libel. We are glad to have had an opportunity of proving that the automatic machines are capable of far better things, and if only the Company can see their way to place each one under better supervision, they need not fear a dearth of clients.

Etching on Glass.—*Cosmos* recommends the following for marking designs or inscriptions on glass bottles, &c.:—Dissolve about 0·72 oz. fluoride of soda with 0·14 oz. sulphate of potash, in half a pint of water. Make another solution of 0·28 oz. chloride of zinc and 1·30 oz. hydrochloric acid in an equal quantity of water. Mix the solutions, and apply to the glass vessel with a pin or brush. At the end of half an hour, the design should be sufficiently etched. Another process, devised by Messrs. Meth and Kreitner, of Berlin, is given in *Invention* as follows:—A mixture consisting of ammonium fluoride, common salt, and carbonate of soda, is prepared, and then placed in a gutta-percha bottle containing fuming hydrofluoric acid and concentrated sulphuric acid. In a separate vessel which is made of lead, potassium fluoride is mixed with hydrochloric acid, and a little of this solution is added to the former, along with a small quantity of sodium silicate and ammonia. Some of the solution is dropped upon a rubber pad, and, by means of a suitable rubber stamp, bearing the design which is to be reproduced, is transferred to the glass vessel that is to be etched.

## PHOTOGRAPHIC METHODS OF OBTAINING POLYCHROMATIC IMPRESSIONS.*

BY LEON VIDAL.

One of the most interesting of questions connected with photography is that of obtaining polychromatic effects, especially now that a high degree of excellence has been obtained as regards the production of pictures in monochrome. We must say at the outset that our object is not to consider the problem of obtaining coloured photographic effects direct from the colours themselves. That is a question for the future. The few investigations and discoveries which have already been made have not thrown much light upon this matter. No practical or artistic effect has been obtained which is of commercial value. We must leave it for our scientific investigators to discover a direct method of photographing in colours, and to crown their labours by putting their discoveries to some practical use. For the present, we propose only to refer to well-known methods, and make use of those pigments only which one finds ready to hand. It is only intended to call upon light to perform those functions which it can so easily carry out in the various photographic processes practised at the present time.

A point which strikes us at the outset is the indifference of typographic and lithographic printers in general to the use of photographic methods. There are, of course, exceptions, but these are rare, and we should be glad to induce a larger number of those engaged in those industries to allow that photography ought to be one of their principal auxiliaries, and to convince them that, by its aid, their work could be executed more cheaply, more thoroughly, and more artistically.

For want of sufficient information it is still thought that photochromy presents serious difficulties, and, for this reason, chromo-lithographers always adhere to their routine methods of copying, either from nature or from works of art. Nevertheless, as we shall presently attempt to show, orthochromatic photography has made sufficient progress for us to be able to use it readily to obtain the real values of the luminosity of different colours, and also for the separation, to a certain extent, of different colours.

In the first of the two methods which we shall describe, the image is copied accurately as regards light and shade by means of photography, and is then coloured by means of rough tones of colour laid on by chromo-lithography, the selection and combination of the colours having been done by an artist in accordance with a pattern. The photographic work is extremely simple, and consists only of the execution of one single negative. This "simple photochromy" (*photochromie simple*) is, at times, of the greatest use, and there are many circumstances under which it is amply sufficient, and it avoids the necessity of having recourse to more complicated methods.

In the second of the two methods, one selects the colours photographically in a manner analogous to that suggested by various investigators, and amongst others by M. Ch. Cros, M. Louis Ducos-du-Hauron, and Ives, of Philadelphia. In this case, the preparation of *several negatives* is useful for obtaining as accurate a selection of colours as possible. We do not say that *three negatives* should be prepared, because it is possible that a larger number may be necessary, or, on the other hand, two or three may suffice. We confine ourselves to methods which are really of commercial and practical value, and we object to the dogmatic theories which lay down that with three primary colours one can reproduce all combinations of colours; that is an ideal which no one has yet attained, either with or without the use of photography. We take this opportunity of protesting against the claim put forward by Cros and others, who have worked on similar lines, that they have succeeded even indirectly in solving the problem of photography in colours. Their method consists simply in obtaining negatives which correspond more or less exactly with certain given colours regardless of the other colours. It is necessary, then, to find the exact tonality of the colours which are to be superimposed, and very rarely will a subject treated according to the indications of pure theory be an accurate reproduction of the original. We, at any rate, have never seen a successful instance. We think, on the contrary, that a photographic selection of colours, however well it may be carried out, ought to be assisted by some retouching. This is all the easier because the whole of the design is present, the modelling is to a great extent exact, and, in a word, it is only necessary to make a few slight corrections on a work already nearly complete. These corrections often consist only of a few blockings out on the negative, or erasures on the printing surface.

In describing, in some detail, this second method, which we designate by the name "composite photochromy" (*photochromie composite*), we hope to explain the services which it can and ought to render to chromo-typographers and chromo-lithographers. We omit not only the numerous varieties of photo-paintings and photo-miniatures, which are only of restricted use, but also photogravure in intaglio, which, except for maps and plans, is unsuitable for polychromatic printing. It is true that by its aid remarkably good work has been done, but it is necessary to paint on the engraved plate, copying the outlines in colours; a delicate and lengthy operation which is necessarily expensive, and only suitable for *éditions de luxe*. It is not a method easy of application, and, moreover, few studios are arranged in such a way as to enable it to be carried out.

Thus, to repeat in a few words the substance of this introduction, we may say that, while we are waiting for the solution of the problem of the direct reproduction in colours of polychromatic originals, there already exist two thoroughly commercial methods of combining photography with the use of colours, so as to give a result which may be as accurate as possible. One of these methods is simply photochromy; the other is composite photochromy.

We will now sketch in outline the nature of these two methods, which, it may be remarked, are by no means mutually exclusive; on the contrary, when the nature of the subject permits, they may be used simultaneously.

*Simple Photochromy.*—This consists, as we have said, in the preparation of one single negative, the positive print taken from which is combined with certain colours, according to the nature of the original. The negative ought evidently to be prepared with all possible accuracy as regards rendering of light and shade, and with this object it will often be necessary to use orthochromatic plates, so as to obtain the best effect. For example, if the subject contains much red, it is necessary to use not the first isochromatic plates which one finds in the market, but plates which have been sensitised for the red rays.

As a rule, ortho or isochromatic plates which are

* Read before the Photographic Society of Great Britain.

sensitive for yellow, are also somewhat more sensitive for green than ordinary plates, but they are absolutely insensitive to red rays. On the other hand, plates which have been sensitised for red by means of chlorophyll, cyanine, or methyl violet, are insensitive to green. If, therefore, the subject contains also an abundance of green (as well as red), it would be impossible to render it accurately by means of a plate sensitive only to yellow and green. (Blue and violet act only too energetically, and with regard to them we need only say that their action must be moderated by means of a yellow screen.) One would also fail to obtain a good result with a plate sensitised only for red and yellow.

If, therefore, one does not possess plates which have a suitable degree of sensitiveness for all the colours, it is recommended that orthochromatic plates already sensitised for yellow and green be used, and that they be further treated with methyl violet, according to the formula given by Wellington in the PHOTOGRAPHIC NEWS of 1885. We thus obtain plates which are sensitive to yellow and green, and also to red.

[A coloured slide of a bouquet of flowers and slides of the three monochromes were shown in the lantern. The red monochrome was prepared by photographing the subject on a Lumiere plate sensitive to the yellow, a yellow screen being used; the yellow monochrome by using an ordinary Lumiere plate without a screen; and the blue monochrome by using a Lumiere plate sensitive to the red, a reddish orange screen being employed to cut off the blue rays.]

(*To be continued.*)

## PHOTOGRAPHIC FORMULÆ.

*A New Hydrochinone Developer.*—Alexander Lainer, of Vienna, for some time past has been experimenting with the various formulæ given for hydrochinone developers, for the purpose of testing, and if possible improving, the same. After many experiments he reached the conclusion, as did Balaguy before him, that the best results were to be obtained by the use of yellow prussiate of potash with caustic potash or caustic soda.

He eventually settled upon a formula for a hydrochinone developer, which permits of exceedingly short exposures, at the same time giving negatives where the detail is well worked out in the shadows; while for reducing power and rapidity of development, it surpasses all other known developers.

Lainer's original formula—the rapid hydrochinone developer—especially useful for instantaneous exposures:

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... ... | 32 ounces |
| Sulphite of soda ... ... ... | 10 drachms |
| Yellow prussiate of potash ... ... | 30 ,, |
| Hydrochinone ... ... ... ... | $2\frac{1}{2}$ ,, |

*Solution B.*

| | |
|---|---|
| Caustic potash ... ... ... ... | 13 drachms |
| Water ... ... ... ... ... | $3\frac{1}{2}$ ounces |

For use, mix for, say, 5 by 7 plate—

| | |
|---|---|
| Solution A ... ... ... ... | 3 ounces |
| Solution B ... ... ... ... | $\frac{1}{2}$ ounce |

For travellers or tourists, Lainer recommends the developer in a concentrated form, viz.:—

A.—(1) Dissolve—

| | |
|---|---|
| Water (warm) ... ... ... ... | $3\frac{1}{2}$ ounces |
| Sulphite of soda ... ... ... | 8 drachms |

Then add—

| | |
|---|---|
| Hydrochinone ... ... ... ... | $2\frac{1}{2}$ drachms |

(2) Dissolve—

| | |
|---|---|
| Yellow prussiate of potash ... ... | $6\frac{1}{2}$ drachms |
| Water ... ... ... ... ... | 3 ounces |

When dissolved, mix both solutions, which will give $6\frac{1}{2}$ ounces.

B.—Dissolve—

| | |
|---|---|
| Water ... ... ... ... ... | 3 ounces |
| Caustic potash ... ... ... ... | $1\frac{1}{2}$ ounce |

Or—

| | |
|---|---|
| C.—Caustic soda ... ... ... ... | 1 ounce |
| Water ... ... ... ... ... | 3 ounces |

To develop cabinet-size plates take—

| | |
|---|---|
| A ... ... ... ... ... | 5 drachms |
| Water ... ... ... ... ... | 10 ,, |
| B ... ... ... ... ... | 2 ,, |

Or—

| | |
|---|---|
| A ... ... ... ... ... | $2\frac{1}{2}$ drachms |
| Water ... ... ... ... ... | 10 ,, |
| C ... ... ... ... ... | $2\frac{1}{2}$ ,, |

If the solutions A and B are mixed it will give $6\frac{1}{2}$ ounces concentrated rapid developer; for use, where rapid development is desirable, 3 ounces of water to each ounce of developer. Where extra rapidity of development is not wanted, take 6 ounces of water to each ounce of developer.

Lainer recommends as a retarder the usual bromide of potash solution (1 : 10), added drop by drop. He further recommends that the well-washed plates be fixed in an acid fixing bath.

When a large number of plates are to be developed with the above developer, it is recommended to have a dish handy with water acidified with several drops of sulphuric acid, to dip the fingers in case they become slippery from the developer.—J. F. S., from *Photographische Rundschau.*

*A Pyro-Hydrochinone Developer.*—Dr. Schleussner recommends the following formula as giving negatives with all the characteristics of the collodion wet plate, showing the finest detail and clearest high-lights, with the advantage of being rapid printers:—

| | |
|---|---|
| A.—Hydrochinone ... ... ... ... | $2\frac{1}{2}$ drachms |
| Distilled water ... ... ... ... | 34 ounces |
| B.—Carbonate of soda ... ... ... | $3\frac{1}{4}$ ,, |
| Distilled water... ... .. ... | 17 ,, |
| C.—Distilled water... ... ... ... | 14 ,, |
| Sulphite of soda ... ... ... | 2 ,, |
| Pyrogallic acid ... ... ... ... | 5 drachms |
| Diluted sulphuric acid ... ... | 10 to 12 drops |

The sulphite of soda is first dissolved in water and acidified with the sulphuric acid, then the pyro is added. For use, take—

| | |
|---|---|
| A ... ... ... ... ... | 4 ounces |
| B ... ... ... ... ... | 1 ounce |
| C ... ... ... ... ... | 1 ,, |

When this solution is slightly warmed the development is much more rapid. It is further recommended to commence the development with old developer until the high-lights appear, then finish with fresh developer.—*American Journal of Photography.*

ELECTION OF JUDGES, 1891 EXHIBITION.—The balloting paper for the election of judges at the forthcoming Exhibition was issued last week with the *Photographic Society's Journal.* It contains the names of twenty-eight nominees, from whom *seven* are to be chosen. The voting papers are returnable by to-morrow, 30th inst., at latest, addressed to the Secretary, Photographic Society, 50, Great Russell Street, W.C. The list is as follows:—Captain Abney, G. L. Addenbrooke, E. A. Austin, W. Bedford, W. S. Bird, V. Blanchard, F. P. Cembrano, jun., Seymour Conway, T. R. Dallmeyer, T. S. Davis, G. Davison, W. E. Debenham, P. H. Emerson, W. England, J. Gale, F. Hollyer, Chapman Jones, H. S. Mendelssohn, H. Moore, A.R.A., P. H. Newman, A. Pringle, H. P. Robinson, J. Spiller, F. M. Sutcliffe, J. T. Taylor, J. B. B. Wellington, B. J. Wilkinson, and Sir H. Trueman Wood.

# Patent Intelligence.

### Applications for Letters Patent.

8,557. ALFRED JULIUS BOULT, 323, High Holborn, London. "Improvements in Photography." (John North, United States).—May 19th.

8,628 WILLIAM GRIFFITH HONEY, 27, Regent Street, Barnsley. "Improvements in Photographic Printing Frames."—May 20th.

8,660. CHARLES HERBERT OFFORD, 15, Tasker Street, Walsall, "A New Hand-Camera."—May 21st.

8,761. GEORGE TEASDALE TEASDALE-BUCKELL, 55, Chancery Lane, London. "Improvements in the Production, by the Aid of Photography, of Surfaces for Use in Printing Colours, and in Means or Apparatus Employed therein."—May 22nd.

### Specifications Published.

28. *January* 1*st*, 1890.—"Feeding Sheets of Paper," &c. R. CRESSWELL, 5, Bedford Place, Russell Square, and M. HESLOP, 100, Houndsditch, both in London.

The pile of sheets is placed on a table, and the bottom sheet is fed forward by a rubber covered or other roller under an adjustable guide bar. The bar keeps back the upper sheets, and may be adjusted for different thicknesses of material by screws, and locked in position by nuts. It may be adjusted laterally by moving certain brackets. Anti-friction rollers may be placed in the table. Rollers may be used when required to receive and deliver the sheets. The feed roller may be driven by a band or by gearing, &c.

36. *January* 1*st*, 1890.—"Stoppering Bottles." R. BROTHERHOOD, Cambria House, Chepstow, Monmouthshire.

A hollow plug, closed at the bottom and surrounded with packing, has ports on opposite sides to correspond with ports or channels in the neck of the bottle. The stopper is held in the bottle by projections, which pass underneath and engage with flanges, and it is turned by lugs or thumb pieces.

40. *January* 1*st*, 1890.—"Decorating Wood." C. HETTWIG, Hollmannstrasse 33, Berlin, and F. HECKNER, Adolphstrasse 51, Braunschwlig, both of Germany.

The wood is first saturated with alum to prevent liquids running in the grain thereof, and then the parts to remain unacted upon are coated with a concentrated solution of caoutchouc in chloroform. The remaining parts are next painted over with copper bichromate, and, before that is perfectly dry, with a solution of pyrogallic acid. The surface is afterwards exposed to the light till the proper colour is developed, which, according to the relative strengths of the solutions used, may range between a greenish hue and a reddish one.

151. *January* 4*th*, 1890.—"Rocking Apparatus for Developing, &c." J. B. BROOKS, Great Charles Street, Birmingham.

The developing, &c , tray is carried on a frame or rest, which is mounted by side trunnions on brackets. Depending from the rest is an arm which is actuated from a crank plate, for rocking the rest by clockwork mechanism provided with a fly, which can be arrested by a push piece to stop the apparatus. Modifications are described in which a gyratory, &c., movement is given to the rest and tray.

173. *January* 4*th*, 1890.—"Picture Frames." F. KITTO, 3, Lower Union Street, Torquay.

Relates to frames for holding photographs and like views, especially for utilising photographers' waste plates by mounting photographs thereon. It comprises a frame, which may be of any material, such as leather, cloth, linen, wood, metal, &c., folded over from the back to the front of the glass plate. In this case a strut is provided to support the frame in a sloping position.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—(Change of Address). All communications and journals should be sent to 50, Great Russell Street, Bloomsbury, London, W.C., instead of 5A, Pall Mall East, or Messrs. Harrison, St. Martin's Lane.

# Correspondence.

### CARDIFF PHOTOGRAPHIC SOCIETY.

SIR,—If we may trespass upon your valuable space, we should like to explain the *raison d'être* of Class 15 at the forthcoming Cardiff Exhibition.

Our object in offering an optical lantern for the best fifty slides of a town or district is merely an incentive to Societies to form such collections; and although we stipulate that the winning slides shall become our property, they are intended to form a loan collection to circulate amongst the British and American Societies. Of course, with the present high standard of lantern slides, the whole of the work sent in should form most interesting collections, and by arrangement with the competing Societies a valuable slide interchange should result, and there, we think, the utility of the scheme comes in. We trust, therefore, it will receive the cordial support of Societies generally.

G. W. BEDFORD, }
T. H. FAULKS, } *Hon. Secs.*

*Cardiff*, 21*st May*.

### "SUN ARTISTS."

SIR,—When the first number of *Sun Artists* was issued, the hopes of those who had faith in photography ran high that something worthy was being done for the art. It was set forth as a "pioneer publication" to teach the world that photography was an art, as well as intended as a monument to the best photography of the time. It began well; the early numbers worthily fulfilled the intentions, but the last three parts have shown a woeful falling off from the high resolve to issue nothing but the best. The decadence began with No. 5, with its violent, controversial, and most ill-advised essay. No. 6 contained pretty but obvious imitations of Mr. Gale's beautiful work, and No. 7, just issued, consists of a selection (and not a good one, for much better results by the same hand may be seen for sale—as is now the fashion with amateurs—in the shop windows) from the works of one of our youngest amateurs, with an essay by a writer who begins by confessing that he has no practical acquaintance with photography.

The lady whose photographs are selected for the new number has shown great talent for the art, but she would have done well to wait until her knowledge became more mature before she allowed herself to appear among the masters. Her portrait of Browning is an exception to the other prints; it is exceedingly fine in all respects. The "Gladstone" is a good illustration of the old-fashioned soot and chalk photograph. The "Rebekah" has a beautiful face and expression, but the figure is very amateurish; the tucking-in of the dress, the hand-made arrangement to represent the effect of motion, has all the merit of good intention, but goes no further; the art does not hide the art. The fourth picture—the "Summer Garden"—has no particular feature beyond the efforts of the ordinary amateur.

The essay is a moderately well-written but hesitating article by a great writer, who, from want of the necessary knowledge of his subject, seems to be in difficulties as to what to say, and it does not appear to have struck the editor that it was his duty to look after the facts of a writer who knows so little of his subject. He speaks of Mrs. Cameron as the *first* to make subject-photographs popular in England. This gifted lady began to photograph in 1864; are Rejlander and Robinson forgotten? I remember reading a cutting from a morning paper of 1858 to the effect that the subject-photographs of these two artists were so popular at that time as to be almost as great a nuisance as nigger minstrels. Of course the writer makes his statement in ignorance, but an efficient editor would have corrected it.

Surely this is not the way to recommend photography to the artistic consideration of the public, or to instruct them in its history.

Is photography so destitute of talent that a few numbers of this publication is sufficient to exhaust it? Where are Mr. Austin's pictures? Inside the cover of No. 6 we are promised that they shall appear in No. 7. Why was the promise not fulfilled? When are we to have Mr. Sutcliffe's photographs?

It is true that he has lately ridiculed the claims of photography to rank as au art; but there was a time, uot long ago, wheu his photographs, which we all thought were pictures, would have graced the collection. Of course, they could not now be admitted as specimeus of photography as an art. Then there is Dr. Emersou; but he also has conscientious scruples. And we are auxiously expecting Mr. Davison's works; but perhaps he is wisely waiting to discover where his strong point lies.

If nothing of the best is left, or to be got, would uot the promoters best fulfil their intention by discontinuing the publication? There has beeu enough published to form a handsome volume, and to do them a great deal of credit for their very praiseworthy intentions. Helios.

## Proceedings of Societies.

The Photographic Society of Great Britain.

At the technical meeting of this Society held on the 26th inst., the chair was occupied by Capt. W. de W. Abney (vice-president).

A magnesium flash-lamp for furnishing a continuous flame of several seconds' duration, sent by M. Nadar, of Paris, was exhibited and explained by the Chairman. Several photographs were also shown to illustrate one of the uses to which the lamp had been put, that of assisting in the exposure of interior subjects. It was said that, by this means, the halation commonly seen round a window iu an interior could be avoided, as the exposure need be no longer than that required for the window, and for any part of the picture seen through it, whilst the lamp would illuminate the dark portions of the iuterior and any figures therein at the same time.

It was pointed out by a member that iu one of the examples sent the window had evidently been masked, and printed deeper than the rest of the picture, so that the lamp had not been entirely relied upon for the effect meutioned.

Mr. W. England said that some of the finest flash-light photographs that he had ever seen had been the work of M. Nadar.

The Chairman agreed as to the excellence of M. Nadar's work in this direction, and also mentioned that some of the very finest hand-camera pictures he had ever seen were in a set of views in Turkestan, taken by M. Nadar with an Eastman half-plate roller slide camera. Paper had been used instead of films, being preferred to the latter by M. Nadar.

"The Influence of Development on Gradation" had been announced as the subject for this evening's discussion, which, at the request of the chairman, was opeued by Mr. G. L. Addenbrooke. He said that he could not do more than repeat what he had said at a meeting when the same subject was discussed, held iu January, 1883. He had then showed a series of negatives that had been exposed under a sensitometer screen, and developed in different ways. The plates had all beeu exposed for just sufficient to enable the figure 25 on the sensitometer to be brought out. One of the deductions he had drawn was that, although the ingredients of the developer might be altered effectively within certain limits, beyond those limits very little effect was produced. Thus, after a certain amount of pyro was added, to put in more only assisted in producing stain, with no appreciable increase of density. So with ammonia; more than a certain quantity had no effect, unless it was to induce fog.

Mr. Atkinson would like to know whether, independent of density, Mr. Addenbrooke had found slow development produce better gradation than rapid development.

Mr. Addenbrooke had not found this to be the case.

Mr. A. Mackie had been making experiments much on the same lines as those of Mr. Addenbrooke, but, in his case, he had developed each plate, whether the developer was a quick or a slow one, until the No. 25 was just visible both by reflected and transmitted light. He passed a number of slides through the lantern to show the effect of variations in the developer, and mentioned that he had found decreasing the amount of pyro or of bromide produced practically the same effect as increasing the amount of ammonia.

Mr. Chapman Jones said that the paper which had been published by Messrs. Hurter and Driffield, and his own observations thereon, had been much misunderstood. He had objected to the statement which had been made without limitations by Messrs. Hurter and Driffield, that the ratios of density were unalterable by development. That statemeut, he considered, required to have certain limitations attached to it. If two plates of a given subject were exposed for a similar time, aud one developed until all procurable details were secured, whilst the other was stopped in a much earlier stage, then, according to Messrs. Hurter and Driffield's proposition, if the latter plate was intensified until the strength of the lights was equal to that of the other plate, the strength of the details in the shadow should be equal too. Those details had, however, never been developed, and he could not find that details which were invisible before intensification showed themselves after that operation. Messrs. Hurter and Driffield's paper was a valuable one, and contained much truth, but there were parts of it to which he took exception. One such part was the statement that difference in formula would not alter the ratios of density. Then, again, differences which he had found to exist had been ascribed by Messrs. Hurter and Driffield to errors in experiment. When these errors all pointed in one direction, he thought their significance ought not to be disregarded. A poiut iu connection with the subject to which he would invite attention was that, although the light worked down from the surface of the plate into the substance of the film, and went deep with strong lights, whilst with faint tones the surface of the plate only was affected; and, although development commenced at the surface, yet these faint tones were the last to appear.

Mr. F. Hurter regretted that his colleague Mr. Driffield was not with him, as he would have been if circumstances had permitted. Photographers were generally under the impression that they could alter the ratio of gradation by changes in the developer, and that impression he and Mr. Driffield had come to the conclusion was a wrong one. That an over-exposed plate could, within limits, be made to yield a uegative giving a passable print was no proof to the contrary. The gradations of such a negative were not the same as in a negative that had received a less exposure. He thought photographers had fallen into the mistake from trusting to the eye instead of making exact measurements. With regard to the case mentioned by Mr. Chapman Jones, he would say that the experiments they had made did not include any in which part of the plate was left undeveloped. The instrument they used for measuring was not perfect, but the errors were not large. They had not found them to exceed five per ceut., and iu Captain Abuey's hands the errors were reduced to still smaller proportions. The use of the word density, as they had employed it, was partly the cause that they had been so much misunderstood by photographers. Mr. Hurter showed by diagrams ou the blackboard his view of the curves density took, and maintained that for any given plate and exposure, the ratios of density as expressed by the length of the ordiuates was the same, whatever developer was used, although the absolute density might vary considerably. Mr. Mackie's experiments he considered defective from two conditions having been altered together instead of being taken siugly. He referred to the alteration of the coustituents of the developer and the time of development. The latter, he thought, should have been kept constant.

Mr. Mackie said that in that case he would, with some of the developers, have had no image at all.

Mr. Addenbrooke believed that differences in the developer did effect a difference in the ratios with which different strengths of the image would appear. Suppose the case of a lady in a white dress, and some very dark object to be included in the same photograph. He would in this case use such a developer as would briug out the details of the dark object before the dress had time to acquire such density as to block up the details. If, on the other haud, he were photographing dark foliage with a bit of bright sky, he would develop so as to bring out the details of the foliage before the sky became too dense.

Mr. Cowan said that the two cases were not of contrary, but of similar character, and the treatment required for the one should suit the other.

Mr. WARNERKE considered that Mr. Mackie was not introducing a second condition when he lengthened the time of development to suit a solution slow in its action, but that it would be introducing a fresh conditiou to cut down the action of the developer in this case before its full effect could be produced.

Mr. DEBENHAM thought the subject of the greatest importance, as no means should be left untried to overcome the principal defect of photography, that of deficient rendering of gradation at the two ends of the scale. So far as the examples shown on the screen that eveuing were concerned, he thonght they were rather in support of Messrs. Hurter and Driffield's contentiou than against it. There was a decided difference in the density of the different plates shown by Mr. Mackie, but not in the comparative density of the varions gradations. Thus, in the most powerfully lighted square, the difference between the place where the glass had been removed was visible in the whole series. He would like to have the opiniou of the chairman as to whether they mnst despair of finding better gradation in the direction of development.

Mr. BENNETT said that he had fonnd a difference of development produce a great difference in gradation of the negative. He had photographed a subject containing white marble and dark woodwork, and, whilst in a photograph developed in the nsnal way the details of the marble were lost, they had been retained in a negative having the same exposnre by the following treatment. Development had been commenced with a solution containing very little pyro and bromide, and a full dose of ammonia, and had been continued with stronger pyro until sufficient density was obtained. In answer to a request, Mr. Bennett promised to bring these negatives to a future meeting.

The CHAIRMAN thanked Mr. Hurter for coming from Liverpool to be present. As to whether gradation conld be affected by development, he could not then presume to say. He very much admired the scientific work done by Messrs. Hurter and Driffield, and, as to their instrument, he hoped to come to an agreement with them. Further discussion on the subject would be resumed at the technical meeting in June, when there might be examples by members of experiments made with the view of discovering more about the subject in hand.

CAMERA CLUB.

ON May 21st, Mr. R. INWARDS in the chair, Dr. J. J. ACWORTH read a paper on "The Flash-Light," and, at the outset, dwelt upon the use made of the flash-light on the Continent for the production of artistic photographs. He exhibited a large number of examples of single figure and group studies, described the appliances in use, and illustrated his remarks by showing specimens of lamps employed in Germany. The working of these was practically demonstrated, and some exposures were made by Mr. Chang. Dr. Acworth then discussed the qualities of the light given by the magnesium flash, and the application of it to orthochromatic work, illustrating his remarks by diagrams.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

A FIELD-DAY was orgauised for the 23rd inst. to Hale End and district. The party proceeded to Chingford old Church, securing several pretty bits on the way. The church was theu taken from several points of view, and the remainder of the afternoon was passed in the meadows beyond the church, where there is to be found ample food for the camera. For these bits, as for the church, a wide-angle lens not longer than the length of the plate is necessary.

On the 25th inst., Mr. F. CHERRY in the chair, Mr. F. W. Cox gave a demonstration on "Kallitype." The paper was coated presumably with a solution of ferric oxalate; this, on exposure to light, is changed to ferrous oxalate, which reduces the silver salt in the developer, and an image iu metallic silver is the result. The paper, both before and after exposnre, presents an almost identical apppearance to platinotype paper. The paper is at least three times as sensitive as silver paper, and, therefore, all developing operations during daytime must be conducted in weak light. A good negative (not necessarily a hard one) will give best resnlts in this as in other processes, and exposure should be stopped when there is a very faint indication of the densest parts of the negative having printed on the paper. Under-exposed prints will develop very slowly, and over-exposed ones come up mealy and muddy in appearance, and are liable to show stains and markings. In developing, the prints are floated, face downwards, upon the developer for a few seconds, and then placed for a short time upon a piece of clean glass to gain density. Shonld bubbles appear, a touch with a camel-hair brush charged with the solution will stop any trouble in that direction. The prints are next immersed in clearing baths, and a final wash iu water completes them prior to drying. The bichromate of potash is to give contrast, and a stock solntion (8 grains in 1 ounce of water), shonld be kept. A drop or two of this added to the developer, when thin negatives are printed from, will be found advantageous. Due allowance must be made, in judging density and brilliancy, for the wet state of the paper, and with the greatest care and cleanliness, stains and markings will sometimes appear. The finished prints range from a bluish black to a purple black in colour, and the demonstrator saw no reason why they shonld not be toned with uranium to a sepia colour, to suit those who prefer a warm effect.

On June 8th, Mr. H. WALKER in the chair, Mr. J. TRAILL TAYLOR will address the Society, when visitors will be welcome.

RICHMOND CAMERA CLUB.

AT the meeting on the 22nd inst. Mr. CEMBRANO presided, and a demonstration of printing on alpha paper was given by Mr. HOWSON. Details of the process were explained, and the queries of members on points of doubt or difficulty were answered.

Field-days now take place once a fortnight, but so far have been marred by the weather.

BRIXTON AND CLAPHAM CAMERA CLUB.

*May 21st.*—Dr. REYNOLDS in the chair. Mr. W. H. Powell, having been suffering from the prevailing epidemic, had been unable to prepare his lecture on "Hand-camera Work," and it was accordingly postponed until June 4th.

Messrs. Hayward, Knight, Palmer, and Reeves were elected members of the club.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the meeting held on May 19th, Mr. J. TRAILL TAYLOR in the chair, Mr. WEIR BROWN explained his method of obtaining warm tones in bromide prints by uranium toning. To obtain the best results he gave a fairly long exposure and obtained, by slow development, a muddy brown coloured image. After fixing and washing, the print was immersed in a bath cousisting of—

| | |
|---|---|
| Nitrate of uranium ... ... ... | 4 grains |
| Ferridcyanide of potassium ... ... | 4 ,, |
| Acetic acid ... ... ... ... | 90 minims |
| Water ... ... ... ... ... | 8 ounces |

The prints required to be slightly over-toned, as the subsequent washing tended to bring back the original colour. In fact, if continued long enough, the whole of the effect of the toning bath would be removed. Mr. Weir Brown passed round a number of specimen prints in illustration of his remarks.

Mr. A. S. NEWMAN read a paper on "High-Speed Shutters," in which he pointed out the difficulties to be overcome in the construction of a shutter designed to work at a speed of over one-hundredth of a second, and explained how he had overcome these difficulties in the shutter which he exhibited. He also, by means of diagrams on the blackboard, showed a graphic method of calculating the effective exposure given by various types of shutters.

The next meeting will be held on June 2nd, when Mr. J. Traill Taylor will lecture on "Stereoscopic Cameras and Appliances."

### Auckland Photographic Club.

The first annual exhibition held under the auspices of the Auckland Photographic Club was opened on the 3rd April at the Auckland Institute Buildings, Princes Street.

His Excellency the Governor, in opening the exhibition, said he thought he belonged to one of two classes of photographers. The first was the artistic class, which possessed all the developments of photography as an art, and gave every subject an artistic treatment; and the other class comprised what were called "shot" photographers, whose only aim and object was to carry away some little reminiscence of a passing scene. He thought he must confess that he belonged to the second class, but, though he was one of the shooting photographers, still he hoped that he had turned out something which might be called creditable work, and that he could not have much sympathy with those who cared only to press a button and let somebody else do the rest. While he did not pretend to be a judge, he felt quite sure that, from its surroundings, Auckland should be one of the leading places in the world for the art of photography. He had seldom seen anything to equal some of the photographs produced in this part of the world. This excellence was no doubt due to the beauty of the natural surroundings, and to the extraordinary clearness of the atmosphere, and he saw no reason why New Zealand, and especially Auckland, should not have a place in the forefront of photographic art.

The exhibition was closed on April 7th, when the lecture room and museum were crowded by eager and interested visitors.

---

Royal Institution.—An extra evening meeting will be held on Tuesday, June 2nd, at nine o'clock, when Dr. Charles Waldstein will give a discourse on the discovery of "The Tomb of Aristotle."

Auckland Photographic Club.—Mr. Henry J. Carson, hon. sec., writes as follows:—"I shall at all times be pleased to enter into correspondence with secretaries of the other clubs, or any photographers, by which means we may be of advantage to each other."

The Queen's Visit to Derby.—The 21st of May was a busy day for the photographers of Derby, both professional and amateur, scores of cameras, from the hand-camera to 18 by 20 size, being called into requisition. Snap-shots were mostly failures, for the day was dark and the hour late. Mr R. Keene had a stand erected in the Market Place, where he obtained some fairly good pictures with exposures of two and three seconds. The ceremony of the presentation of the casket containing the address, by the Mayor, took place in front of the Town Hall, beneath a huge canopy, which stopped the greater part of the little light there was at 6.30. Before leaving the town, the Queen accepted from the Mayoress, on the behalf of Mr. R. Keene, a handsome volume of his platinotypes of the "Interiors of Hardwick."

Received.—From A. Kersha, St. Petersburg, No. 1 of the *Pantobiblion*, the purpose of which is stated to be to help literary men concerned with the applied sciences generally, and particularly those devoted to any technical studies of any speciality, to be promptly, exactly, and completely informed of the correspondent branch of current scientific literature, and that, to attain this purpose, it contains a classified list of all the new books, published in all the principal languages, in all the countries of the civilised world, on different scientific subjects connected with the applied sciences as named above; a series of critical articles on the leading scientific publications of the world; and a review of the current periodical literature of the world, showing the contents of all the chief scientific magazines of the day devoted to the applied sciences, and published in all the principal languages.——From Horne, Thornthwaite, and Wood, "A Photograph, and How to Take It," a combination of manual of instruction and trade catalogue, each useful in its sphere.——"My Camera, and How to Use It," by John Piggott, is a comprehensive illustrated trade list, prefixed with brief instructions on exposure, development, fixing, printing, and toning.——"Practical Amateur Photography," by C. C. Vevers, Leeds. We have received the fourth edition of this useful little manual.

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

Ed. Liesegang (Düsseldorf). — *Physical Society of London.* The head-quarters of this society are at South Kensington, S.W., Professor Ayrton, F.R.S., being the president. On the 9th ult. the members paid a visit to the Cavendish Laboratory, Cambridge University, where papers were read and the collection of physical instruments inspected.

H. Dorn (Leipsig).— *Zinc Clichés.* We regret to say that we cannot find any reference to Tulson's process; could you give us a date respecting it, or a few particulars to guide our search? Türcke's zinc etching process is described and illustrated in our Year-Book. Is this what you want?

M. Cappelli (Milan).—*Coating Machine.* The specification to which you refer is dated December, 1890, and can be procured either from the Patent Office or the agent, Mr. A. J. Boult, 323, High Holborn. To save delay and trouble, we are sending you a copy.

Photoman (Paris).—1. *Abney's Collodion Emulsion for Red Rays.* Without going back to the *Phil. Trans.* of 1880, we find in Capt. Abney's "Instruction in Photography," eighth edition, 1888, page 146, the following formula:—Ether 5ozs., alcohol $2\frac{1}{2}$ ozs., pyroxyline 75 grs. Dissolve 200 grs. zinc bromide in smallest possible quantity of alcohol, and add 4 or 5 drops of conc. nitric acid. This bromide is then added to *half* the above collodion. Now dissolve by heat 330 grs. silver nitrate in half an ounce of water, and add $1\frac{1}{2}$ oz. of hot alcohol. Add this solution to the other half of the collodion, and, with brisk stirring and very cautious addition, pour the bromised collodion into it. Precautions:—See that the silver is in excess by testing a drop with potassium chromate, which should give a red colouration or precipitate. Try also the quality of the film, which should appear red by transmitted light. You will notice that the proportion of pyroxyline to zinc bromide is much larger than that given in your letter, and this will render the emulsification easier. 2. *Discussion of Messrs. Hurter and Driffield's Paper.* You will find Capt. Abney's and Mr. Chapman Jones's replies, as given at the Parent Society, in the News of November 14th, 1890, page 893.

A. B. C.—Mr. H. P. Robinson has written two books bearing on portraiture: "The Studio, and What to do in it," and "Pictorial Effect in Photography." There is also a little shilling manual called "Heighway's Practical Portrait Photography." All three are published by Messrs. Piper and Carter.

C. Jones.—*Bromide Enlargements.* The information as regards apparatus is given at page 137 of Mr. W. K. Burton's "Modern Photography." Details of process were fully described in the News of January 17th, 1890.

L. P.—*Competitor's Declaration.* The wording is strictly according to the usual form applicable to such cases.

A. H. C.—*Elementary Book of Instruction.* Either Marion and Co.'s "Manual, or W. K. Burton's "Modern Photography."

G. L. A.—The circular was returned by post on Monday last. We thank you for the opportunity of perusal.

A. H. Greenhill.—*Photographic Paper.* See answer at the head of this column last week. Have you tried the Saxe paper (Steinbach, Malmedy), or that of B. F. K. Rives, size $17\frac{1}{2}$ by $22\frac{1}{2}$ inches?

R. H. M.—*Yellow Spots on Silver Prints.* These are undoubtedly due to sulphide of silver, and appear to be formed in consequence of insufficient agitation in the fixing bath or bubbles not quickly dispersed. Try preliminary washing in a weak borax bath before fixing your prints.

Ed. Cetti.—*Rapid Filtering Funnel.* We believe your idea to be new, but this opinion must not be taken as absolving you from the duty of making a search at the Patent Office.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1709.—*June* 5, 1891.

CONTENTS.



## SOME NOTES ABOUT CLOUDS.

In the early spring, when the light is at its best, and when showery weather alternating with brilliant sunshine is the order of the day, it is comparatively easy to secure clouds in the same negative as the landscape, and it need hardly be pointed out that this is an advantage that one cannot value too highly. When such clouds are present in the negative, it is too often the case that they are buried in the film during development. When they first show themselves in the early stage of that operation, the photographer is delighted, but too often leaves them to take care of themselves while the details of the landscape below are unfolding themselves. In nine cases out of ten the sky will, under such circumstances, become so dense that clouds and what should be open space are merged together in one black mass. If, on the other hand, the photographer will take a little trouble, this destructive action can be easily stopped. When the sky first shows itself sufficiently to discover cloud-forms which are worth preserving, let the negative be lifted from the dish and well washed under the tap. Now hold it so that the sky is dowuwards, and, with a camel-hair brush charged with bromide solution, paint the surface of the sky, just as if you were laying-in a water-colour tint. Water-colour artists frequently paint in their skies while the picture is inverted, so that the colour shall not stray where it is not wanted. The inverted position is recommended here for the same reason with regard to the bromide solution. Now place the negative once more in the developing bath, and the landscape portion can be coaxed out without any fear of blotting out the clouds by over-development.

There are numerous shutters which are so contrived that the sky portiou of the picture gets but a fraction of the exposure which the landscape receives. Leisk's sky shutter is a clever contrivance, and one which acts well in securing this end. The use of isochromatic plates with a yellow screen is also a great help in securing printable clouds in negatives, with the disadvantage, however, of a somewhat protracted exposure. Some photographers make use of a sky-shade outside the lens hood for shielding the sky from the negative during the greater part of the exposure, and these sky-shades are of various designs, as anyone can see for himself by referring to the photographic annuals for past years. One writer, we remember, recommends the use of a ruby glass backing to the dark slide, so that, with head under the focussing cloth, one can see the amount of shading to give to the lens in order to mask the sky properly. It is obvious that most of these devices are only applicable to open views and landscapes where there is a visible horizon, that is, a plain line of demarcation between the sky and the rest of the picture. But in seascapes, where the whole of the picture, sky and water, is equally illuminated, no dodging is really necessary, for a very quick exposure will secure clouds and waves at the same instant, and without the least difficulty.

In photographing cloud effects, one is apt to be led away by the beauty of the colouring. A beginner in photography generally makes this mistake with every subject which presents itself. He sees on the ground glass screen a brilliant blue sky embroidered with fleecy clouds, purple hills in the distance, relieved, perhaps, by brilliant green trees, and grass bespangled with cowslips in the foreground. "What a lovely effect!" thinks he, and he takes a photograph, only to find out, later on, what a mistake he has made in supposing that such a view could make a satisfactory picture in monochrome. But more experienced eyes are apt to be deceived in this way by the wondrous colouring of cloudland, and forget that they must study only form and light and shade. A man who is colour-blind would probably make the best photographer of clouds, and an engraver, used to shutting his eyes to colour, would do as well.

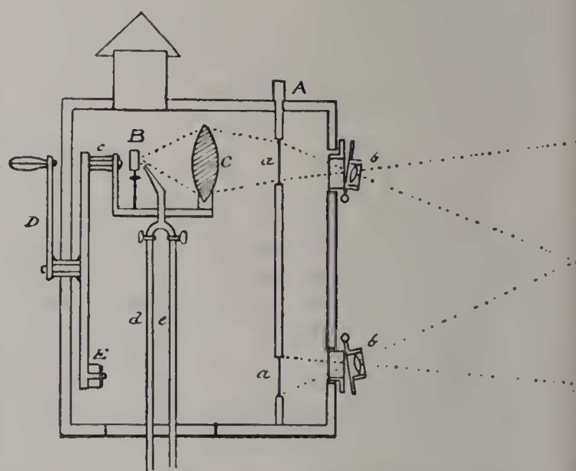
It is pointed out in most of the text-books that the photographer, if he print in a sky from a separate negative, must be careful to see that the direction from which the clouds are lighted agrees with the direction of the light which illuminates the landscape to which they are to be wedded. This is a very trite remark to make, and there is no question of its foundation in truth. But, as a matter of fact, it is sometimes most difficult to determine the place where the sun is in hiding in a cloud negative. This is the case when we have a sky covered with broken clouds of the cumulo-stratus variety. As an example, let us suppose that we are walking westwards along Fleet Street in the late afternoon, and that the sky be fair, but covered with these brilliantly illuminated clouds. The warm-tinted light is reflected upon the houses on *both* sides of the street, and, as there is no direct sunlight, there are no cast shadows. Now, does it not stand to reason that such a sky can be wedded to any landscape, provided that the latter has not been taken in actual sunshine? In such a case the clouds are so well lighted, and their form so permits of the illumination of all their edges in equal proportions, that it is quite impossible to say that the sun is at the right or the left. The power of reflected light from a large mass of cloud is another factor which is not generally taken into consideration, but which, in nature, often modifies the aspect of a landscape to an immeasurable extent.

Another question, which is apt sometimes to be lost sight of, the photographer would often do well to ask himself before he begins to select a sky negative to print into his picture, and it is this: "Ought this picture to have clouds?" In order to answer this question he must refer to his note-book, or trust to his memory, to learn whether there were clouds present when he took the picture. If not, and if a plain grey or blue sky covered the landscape on the occasion when the picture was taken, surely he will do better to endeavour to imitate that appearance by giving the sky portion of the print additional exposure, than by wedding it to clouds which do not belong to it. In pictures taken abroad, in sunny situations where clouds are unknown, their introduction is clearly a mistake, and one which would certainly be resented by anybody familiar with the country. As an extreme case, we might cite the folly of introducing English clouds into a view of the rainless valley of the Nile. Yet such things are done, and are really as ridiculous as the practice of some old artists in dressing up Biblical characters in 16th century English costumes.

Artists in the old days made the common mistake of drawing their feather-bed-pattern clouds — and many of them acknowledged no other form—at or near the zenith of their skies; but supposing that the forms which they drew were actually like the cumulus cloud—and we may take it for granted that they were certainly meant to imitate that form of cloud—they were wrong in putting the cumulus in such a position. For a cloud mass of this character generally rests upon a flat base which is not very much above the horizon, and it stands to reason that, by the time the top of the cloud mass reaches the zenith, the base covers the ground below, and shuts it out of sight. The only observers, therefore, who would be in a position to view a cumulus cloud in such a position must be in a balloon, and adjacent to its sides.

## OPTICAL LANTERN FOR PROJECTING PICTURES OF MOVING OBJECTS.

We will not attempt to decide whether the long-sought solution of the problem of throwing upon a screen lantern pictures of moving objects is to be found in the apparatus described and illustrated here; it is a fact, however, that it has just been constructed by a well-known optical house in Vienna—that of W. Prokesh—and has given satisfactory results. The arrangement is as follows:—The pictures, *a a*, are placed in an upright position in a wooden carrier, and as close together as possible, in a circle. In front of every picture is placed an objective




lens *b b* (in the accompanying engraving only two are shown; in reality, the apparatus possessed twelve), which can be made to incline towards the centre of the apparatus all together, by means of a hinge and adjusting screw. The inclination of each lens is so arranged that the image formed by them will coincide, at whatever distance the screen may be placed.

As an illuminant, the ordinary lime-light can be employed with the lime cylinder *B*, and the condensing lens *C*, which produces somewhat converging rays, lights up one picture after another. The jet and its belongings are turned by means of a simple mechanism, slower or faster as is necessary, in a circle by the handle *D*, so that the lighting apparatus retains its upright position by reason of its own weight. It is fastened very loosely on to the support *c*, so that it moves easily. The two india-rubber tubes, *d* and *e*, pass up and down through an orifice in the bottom of the case. The mass of lead, *E*, serves as a counterweight to the lighting apparatus.

The action is plain. The pictures, lighted one after the other, are thrown on the screen exactly in the same manner as dissolving views, only very much more quickly, and they give perfectly the effect of moving objects. The apparatus is, in this, its original form, constructed for twelve pictures only, but it could be made, however, with very little difficulty to hold a large number of pictures.—Translated from an article in *Photographisches Archiv.*

Royal Institution.—At the general monthly meeting on Monday, June 1st (Sir James Crichton Brown, M.D., LL.D., F.R.S., treasurer and vice-president, in the chair), Messrs. R. W. Peregrine Birch, William Edmonds, Nicholas Eumorfopoulos, Harold Swithinbank, Mrs. Charles Hoare, and Mrs. Edward Singleton were elected members.

## PERSPECTIVE IN PHOTOGRAPHY.

BY W. H. WHEELER.

The remark in Mr. Pennell's paper, read at the late Camera Club Conference, on what he called "photographic perspective," may help to assure us by its very tone that whatever really be the discrepancy felt between that which a cultivated eye sees in a natural view, and that which we may sometimes observe in a wide-angle photograph, we must trust to ourselves, and not to artists, for a real and scientific investigation, that we may know something of the true relations between visual and photographic perspective. At present, whenever an artist who has the slightest knowledge of photography refers to the subject in a reasonable tone, he, as a rule, simply recommends us all to eschew wide-angle lenses. No doubt they are difficult and deceptive tools, and no doubt, also, that when employed without the guidance of principles which have yet to be duly recognised, it is largely a matter of good or bad fortune whether an harmonious perspective results, not to mention the serious distortion, in the ordinarily accepted sense of the term, which results from a comparatively small error in adjusting the camera. The result of my own experience in architectural photography does not agree, however, with the prejudices expressed by artists.

Living and working in what we lovingly claim to be the most beautiful city in the world, and surrounded by architecture which yields to none in its picturesque beauty, problems of artistic perspective have been continually before my mind, as the scenery itself before my eyes. I have used lenses of each extreme, from a focal length of five times the larger dimension of my plates, to less than half that dimension; yet never exceeding, or expecting ever to exceed, the extent of view which artists have chosen to embrace in the views by which they have endeavoured to depict the general effect of an Oxford quadrangle, or, in some cases, of the interior of an Oxford college chapel. Their practice, however, is but little guide to ours; for being free from our limitations and difficulties, they have no occasion to study them. Indeed, to do them justice, it is not natural to expect that they would study our difficulties or our facilities, contenting themselves with such slight knowledge of either as artist amateurs may hastily acquire. And, while it would be presumptuous and foolish to underrate the value of an artist's cultivated perception, his whole method and means differ so fundamentally from ours, that however valuable may be his judgment of results, his advice as to means is rarely of any use. In this matter it is for us to find out what are the conditions of the use, and what of the abuse, of wide-angle lenses; and it is for us to search out the reason *why*, when a general wide-embracing view of buildings is seen by natural vision as picturesquely grouped, and as harmoniously proportioned, the photograph which should, and probably does, depict that view in accurate geometrical perspective, will sometimes, *but not invariably*, appear as violently strained by such perspective. Artists cannot or will not tell us; but philosophers have searched more deeply, and from them we may find the key.

As we know that a well-corrected doublet lens, or indeed, a simple pinhole, will necessarily present a view in absolute geometrical perspective when properly placed, it must follow, when any discrepancy is felt between what the eye demands, and that which the lens supplies, that this strict geometrical perspective does not necessarily agree with the more or less cultivated visual perception with which it is compared. Also, that if the photograph be a strict transcript of natural form, then there must be a difference in our visual perception according to our visual attitude; *i.e.*, according to whether we are looking on nature, or at the photograph. The question is further complicated by the fact that while our photograph is delineated on a plane surface, such a surface corresponds neither to nature itself, nor to our vision of it. This projection on a plane surface is, indeed, an essential part of the problem of geometrical perspective, and is itself one reason why we cannot expect our natural vision to be in accurate accordance with such perspective. Some difference there must be.

It is clear that our first enquiry should be concerning visual perception. Of this the Berkeleian theory is the one universally accepted, having gradually convinced every student, scientific or philosophic, for nearly two centuries. It will probably, however, always present difficulties of conception to those who have not earnestly studied the matter. The prevalent belief that visual perception is wholly the exercise of a natural faculty, instead of being mainly an acquired judgment in interpreting the signs presented to us through sensation, need cause no more surprise than the belief, once universal, that the sun goes round the earth. And both will hold their ground in common speech long after the belief which that speech represents may have died a natural death.

The Berkeleian theory calls upon us to distinguish between the original, natural gift of visual sensation, and those conclusions and inferences which seem to be inextricably associated with it; in an experience dating from our earliest infancy, and commencing long before the rise of consciousness. The mental operations involved are almost always automatically exercised so far as our conscious experience is concerned, and are, to a considerable extent, shared by the lower animal creation—belonging, indeed, to that class of mental results which Mr. G. F. Romanes distinguishes by the term "recepts," from the more elementary "percepts" on the one hand, and, on the other, from the more advanced "concepts," which involve that conscious intellectual effort which is man's special prerogative. In connection with this presumably unconscious mental action, one consideration should be pointed out. In these acquired perceptions of sight, our estimates of distance—and, with them, of the *actual* form and dimension of objects—enable us to recognise those known by previous experience, in spite of the widely differing forms and dimensions of their sensible images on the retina; corresponding, as apparent forms must, to changes of our position and distance. But thus the actual interpreted perception, though really the result of an intellectual process, will never rest in the memory *as such*, whether accompanied by consciousness or no; for it follows, from the natural and general predisposition of the mind to pass from the signs by which we interpret these distances, &c., and to rest on the interpretation sought, that the attention, being thus called from the sign to the object, will of itself inevitably cause the mental process of interpretation to sink out of recognition or memory; and thus, facts which have really been inferred by exercise of intellectual power are quite naturally regarded as having been actually seen through a physical process, the mental interpretation being ignored. Perhaps no illustration of this can be more forcible and obvious than what we suppose ourselves to see in an open book. The wit, the eloquence, the learning, all exist necessarily in the mind only; that which the eye has seen by mere natural sense can be no more than a series of black marks on white paper.

That this distinction was unknown to antiquity we may see from Aristotle (Eth. Nic., lib. ii., c. 1):—"For it is not from seeing often, or from hearing often, that we get these senses; but, on the contrary, instead of getting them by using them, we use them because we have got them." An able modern writer would have made an exactly opposite reflection. The gradual formation of truer mental, as of physical, theories of vision, appears to have commenced with Alhazen, whose discovery of refraction overthrew at once the Greek notion that sight was something emanating from the eye, and also the Democritean effluxes of outward things, which, impinging on the eye, accounted, on atomistic principles, for our visual perceptions. Dugald Stewart says that "some of the chief steps in this progress from Aristotle to Berkeley may be traced in the 'Optics of Alhazen'" (Lib. II., N.N. 10, 12, 39). Dean Milman says of Aquinas that "St. Thomas rejects the Democritean theory," . . . and considers . . . "the conception by the senses is confused, indeterminate, till abstracted, analysed, at once universalised and individualised by the intelligence" (Lat. Christy., V. 6, p. 286). Tennemann says of Telesius, whose teaching in physics was followed by Lord Bacon, that he "maintained that sensation was not absolutely passive, but a perception of changes operated in the mind itself. Knowledge acquired by means of inference he described as a species of imperfect sensation" (Hist. Phil., 298). Dugald Stewart says, concerning Ralph Cudworth, that "the mind, according to Cudworth, perceives by occasion of outward objects as much more than is represented to it by sense; as a learned man does in the best written book than an illiterate person or brute."

And so on through Locke, whose anticipations are acknowledged by Berkeley, until we come to his own far fuller development. Since that time, however, our physiological knowledge has so wonderfully advanced that a further application of Berkeleian theory seems really called for, although Helmholtz, himself a disciple of Berkeley, has done much in this direction. Still, strangely enough, its application to the formation of our sense of perspective has escaped the attention it deserves, and really needs.

The author of a "Practical Guide to Perspective,"* now before me, calling attention in his concluding paragraph to "the *mistakes likely to occur* in drawing from Nature," emphasizes the "endeavouring to draw them rather as they *know them to be*" than "*as they appear to be*" (the italics are his own). In this he unconsciously testifies to natural tendencies in the ordinary observer, which artists rightly combat only so far as found necessary.† Still less necessary is it for them to rigidly carry out in every detail the alterations of form incident to projection on a plane surface. We certainly cannot in this way modify our own pictures in accordance with our perceptions; but a true theory of those visual perceptions may enable us so to oppose our natural recognition of actual form, to our natural revolt from the conditions imposed on us by plane projection, as that they may tend to correct, instead of reinforcing one another, as is too often the case. Also a true psychical theory of those signs which we interpret as "height" and "space" will be found to guide our practice far better than any empirical rule. All this, indeed, we know as enquirers after scientific truth, and I trust I may succeed in calling the attention of other enquirers also to this interesting and important field.

* James P. Knight.

† See also a letter from the present writer in the Photographic News of July 4th, 1890.

## THE ACTINOMETER AS A GUIDE TO EXPOSURE.

Some time ago two English experimenters, Messrs. Driffield and Hurter, took up the question of the relation of the light intensity to the effect on the photographic plate after development. They attacked the question, not from an artistic point of view, but on the side of purely scientific inquiry. For this purpose they first proved by experiment that a harmonious picture has a gradation of light and shade which varies in a geometric ratio; that is to say, the relation of the highest lights to the deepest shadows is in the proportion of 2 : 4 : 8 : 16 : 32 : 64, &c. By another series of experiments they proved that the silver deposited on the negative taken from such a harmoniously lighted object would vary as the figures 1 : 2 : 3 : 4 : 5 : 6, &c. It was further proved that the light transmitted by such a negative varies as the proportion 2 : 4 : 8 : 16 : 32 : 64, &c. It follows, from this last fact, that a harmoniously lighted object will give a negative that prints correctly if the silver is deposited on the negative in the proportion given above. A certain range of variation from the proportion given is allowable, owing to the fact that the eye does not notice slight differences; but any wide variation is at once noticed in the results that we call under or over-exposure. We cannot give all the proofs which these experiments brought forth, but we take space to quote one of the most interesting sections of the work done on this most interesting problem.

"Three separate exposures were made upon different parts of a Cramer plate, extending across its width. The exposures given were equivalent to one and a-quarter, two and a-half, and five seconds, the light being that of a standard candle placed at a distance of one meter from the plate. The plate was then cut lengthways into three strips, each of them being impressed with the same three exposures. The three strips were next developed in the same solution of ferrous oxalate for four, eight, and twelve minutes respectively:—

| | Exposure CMS. | Density. | Density ratio. | Opacity. | Opacity ratio. |
|---|---|---|---|---|---|
| Strip No. 1, developed four minutes ... | 1·25 | ·310 | 1·0 | 2·04 | 1·0 |
| | 2·5 | ·520 | 1·67 | 3·31 | 1·62 |
| | 5·0 | ·725 | 2·33 | 5·30 | 2·59 |
| Strip No. 2, developed eight minutes ... | 1·25 | ·530 | 1.0 | 3·38 | 1·0 |
| | 2·5 | ·905 | 1·70 | 8·03 | 2·37 |
| | 5·0 | 1·235 | 2·33 | 17·18 | 5·08 |
| Strip No. 3, developed twelve minutes ... | 1·25 | ·695 | 1·0 | 4·95 | 1·0 |
| | 2·5 | 1·140 | 1·64 | 13·80 | 2·78 |
| | 5·0 | 1·625 | 2·33 | 42·17 | 8·51 |

"The second column gives the densities as measured by our photometer, which numbers relatively express the amount of metallic silver deposited per square inch of the plate. The density due to glass, gelatine, and any fog inherent in the film, is deducted. It will be seen that the amount of silver increased for the same exposure as the time of development was prolonged. But the third column, which gives the ratio of densities, shows that, within trifling errors of observation, the relationship between the three densities of each strip is identical; that is to say, prolonged development caused each density to grow, but in such a manner that the amounts of silver on the different strips still bear the same ratio to each other.

"It is this unalterable relationship which we refer to when we say that the photographer has no control over the gradations of a negative. What we believe has given rise to contradiction of this view is the fact that, though the density ratios are unalterable, the opacities, which appeal directly to the eye, actually do alter, not only in amount, but in ratios also, as is shown by columns 4 and 5. In the first strip, for instance, the extreme opacities were 2·04 and 5·30 respectively, while, after eight minutes more development, the opacities became 4·95 and 42·17 respectively. The lightest shade in strip No. 3 is almost as opaque as the darkest in strip No. 1. The opacity ratios have, however, also increased from as 1 : 2·59 to as 3 : 8·51.

"It is this great difference in the opacity ratios, with which the practical photographer is so familiar, which leads him to rashly contradict our statements with respect to the unalterability of the density ratios. The great mistake the photographer makes is in assuming that the opacity ratios are alterable at will. This is not so. The opacity ratios alter in accordance with fixed laws, just as surely as by the same laws the density ratios are unalterable. All the control the photographer can, therefore, exercise in development must result from intelligently working in obedience to these laws, and so rendering them subservient to his own ends. Control in development does exist, but not in the direction popularly supposed."

From these experiments it is extremely important that some method of measuring the intensity of light transmitted by objects to be photographed should be made available for the photographer. Such an instrument is called an actinometer. Various forms of this device have from time to time been proposed depending on the passage of light through varying thicknesses of material that obstructs its passage. In this case no attention has been paid to the quality of light passing, the luminous rays only being taken into consideration. But it is well known that the rays that have an effect on the photographic plate are those that are not brightest to the human eye. The rays that affect the photographic plate are the blue and violet ones, and these are the very rays that are obstructed by the materials most used in the ordinary forms of actinometer. In other words, the light passing through the material consists of those rays that are yellow or near that colour in intensity. Quite recently a form of actinometer has been devised that takes note of the blue and violet rays that are reflected by an object that it is desired to photograph. This actinometer depends on the fact that luminous paint exposed to light acquires its maximum intensity after a certain time of exposure, and if this is now taken out of the influence of the light it will gradually fade, the time of fading being a measure of the value of the light in the blue and violet rays that it contains. These rays are the same as those that affect the photographic plate. It is, therefore, only necessary to have some means of determining the moment of fading, to use this principle as a method of determining the value of light from any source, and by comparison with any kind of dry plate to make a set of tables that shall give the correct exposure for those plates under any circumstances.

This novel form of actinometer is the invention of Mr. E. G. Ballard, and is certainly the simplest and most useful instrument of the kind that we have ever come across for the purpose of obtaining an accurate estimate of the time of exposure for any object that it is desired to photograph. The instrument consists of a tube blackened inside, at one end of which is an opening to view the interior, while at the other end there is a disk carrying a surface of luminous paint with an opening in the centre, behind which is a piece of blue glass covered with tissue paper, to tone down the light transmitted to that evolved by the luminous paint when the latter is excited. To use this actinometer it is only necessary to expose the luminous paint surface to the object to be photographed for thirty seconds, then turn the surface so that the light emitted by it is seen in the blackened tube. By now counting the number of seconds that it takes for the light to fade to the same intensity as that transmitted by the tissue-covered blue glass, a figure is obtained that gives the intensity of the light toward the photographic plate. If the value of the plate has been previously determined for that actinometer, and a table of exposures has been made out, the time of exposure will be accurately known from the observation made. We have used this little instrument with much satisfaction, and under widely differing circumstances, and must say that we are delighted with the results. The exposures that it told us to give were not what our judgment would have given us from ordinary observation of the light, but they proved to be correct, and the negatives obtained were found to be correctly exposed.—*Anthony's Bulletin.*

---

Ammonium Bromide.—Dr. Dutton, says the *Chemical News*, reviewing "Sea Sickness—Cause, Prevention, and Cure," seems to hold that if there is a specific for sea sickness, it is our old photographic friend ammonium bromide taken regularly for some days before going on board. It acts, as it might be expected to do, as a restrainer.

Brixton and Clapham Camera Club.—On 23rd May nineteen members of the club travelled to Bexley by invitation of the president, Mr. A. R. Dresser. After several shots at the church, farmyard, &c., the whole of the cameras belonging to the party were levelled at some sixty or seventy cows, which had gone down to water at the river. This over, a photograph of the party was taken. The members afterwards sat down to a substantial tea, kindly provided by the president. The weather was beautiful, and a total of 170 plates was exposed.

Photographic Exhibition at Leeds.—A National Photographic Exhibition on a large scale is to take place in Leeds towards the end of the year, promoted by the Fine Art Gallery Committee of the Leeds Corporation and the Leeds Photographic Society. The probable time of opening will be towards the end of November, and the Exhibition will remain open until the middle of January. The official prospectus will shortly appear; in the meantime, any information may be obtained from Mr. George Birkett, Curator, Fine Art Gallery, Leeds.

Another Marvellous Invention.—The Paris correspondent of the *Times* telegraphs:—"I went last evening to the central office of the new company which is interested in the instrument known as the theatrophone. As the name indicates, this instrument is intended to transmit, by means of a clever adaptation and application of the ordinary telephone, everything audible which goes on upon the stage of the various Paris theatres. The Théâtre Francais, the Opéra Comique, the Bouffes, the Nouveautés, and some others have already consented to admit the theatrophone, and before long the Grand Opera, Gymnase, Vaudeville, Folies Dramatiques, and, indeed, almost all the theatres will form part of the theatrophonic network. It will thus be possible during the evening to hear and give one's friends the pleasure of hearing all the comedies and operas produced on the Paris stage."

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

NEW PROCESS OF DOCTORING FLAT NEGATIVES—TONING AND FIXING BATH—NEW FLASH LAMPS.

*A New Process of Doctoring Flat Negatives.*—Herr F. Schmidt, who has just published a new and very practical handbook of photography, describes in this book a method of doctoring flat negatives which, as he states, has never before been published, and which is said to give excellent results. It is due to Mr. Döll, of Karlsruhe. The negatives to be treated by this method should not be varnished; or, if they are already so treated, the varnish must be removed beforehand. The process consists essentially in coating the surface of the negative with carmine ink—a solution of carmine in ammonia. If the negative be flat throughout, without any boldness worth mentioning, it is at first soaked for a few minutes in plain water, and then placed in a dish containing real carmine ink diluted with equal parts of water. The plate is allowed to remain in this bath until its film has been sufficiently saturated with the dye, when it is removed and thoroughly washed. The dye taken up by the gelatine film is not removed by the subsequent washing, and the negative comes out with an entirely uniform, beautifully transparent coating, which may be obtained in any desired gradation. Should it be desired to remove the dye from some portions of the film, it is only necessary to pass over these portions a fine brush saturated with a dilute solution of *eau de javelle* (1 : 2 water), and to rinse them at once very thoroughly with water. If the negative shows, however, only partial flatness, it should be treated as follows:—The plate, whilst still wet, is placed between smooth blotting-paper and wiped off slightly; then it is laid horizontally on a larger glass plate, which rests upon two small blocks or boxes. Beneath the negative and the glass plate a mirror should be adjusted so that the negative is uniformly well lighted by it. The diluted carmine ink is now applied to the flat portions by means of a large brush, care being taken that the outlines are not exceeded, and that the work is done quickly. The solution is allowed to act upon the film for a few minutes, when it is removed by means of a soft sponge. The plate is then washed, and, if required, the process may be repeated once or several times after the plate has been again slightly dried between smooth blotting-paper. If it is intended to produce a soft vignetting gradation, diluted carmine ink (about 1 : 3) is applied to the plate whilst still wet by means of a large brush, and the plate rinsed with water after some time, the portions which are to be rendered denser being afterwards treated repeatedly with the ink.

*Toning and Fixing Bath for Emulsion Paper.*—The following combined toning and fixing bath is highly recommended by Joh. Wolf in *Der Amateur Photograph*. It is said to tone well and quickly all emulsion papers and celloidin paper, and it is only necessary to filter it from time to time. It consists of—

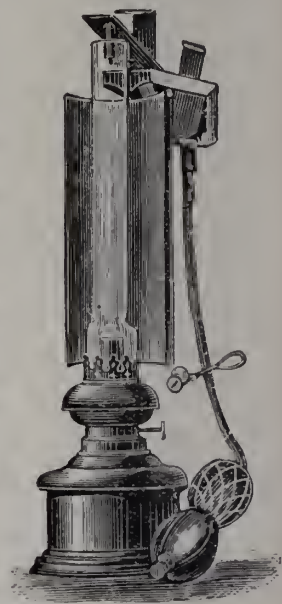
| | |
|---|---|
| Water ... ... ... ... | 1,000 c.c. |
| Hyposulphite of soda ... ... | 250 grammes |
| Sulphocyanide of ammonia... ... | 27 ,, |
| Acetate of lead ... ... ... | 10 ,, |
| Nitrate of lead ... ... ... | 10 ,, |
| Citric acid ... ... ... | 7·5 to 10 ,, |

To which is added—

| | |
|---|---|
| Chloride of gold ... ... ... | 1 gramme |
| Water ... ... ... ... | 200 c.c. |

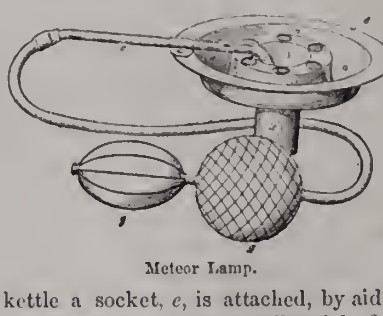
The best effects are said to be obtained when the bath has a temperature of from 66° to 73° F.

*New Flash Lamps.*—The magnesium flash-light apparatus invented by Dr. Leonhard, and introduced under the name "Fulgur lamp" by the firm of Dr. Adolf Hesekiel and Co., of Berlin, is much in favour amongst amateurs and professionals. The arrangements are considerably simplified by the use of the "Fulgur lamp," as it may be attached to any paraffin lamp with a glass chimney. The magnesium powder is not blown into the lamp in the direction of the gas escaping from the lamp, as is the case with some flash lamps, but in an opposite direction, it being thrown by a mechanical arrangement from above into the chimney. By this arrangement, combustion of the magnesium powder is completely and quickly effected with an intense light, the speed of combustion, according to the researches of Prof. Eder, being about one-thirteenth of a second. The instrument, which may be attached, as already mentioned, to the upper end of the chimney of any paraffin or gas lamp, consists of a kind of sling, which is bent by elasticity and released by a pneumatic bellows arrangement. The annexed cut shows the lamp after the release of the spring. The magnesium powder in combustion will adhere only to the inside of the chimney, and may be easily removed after use, so that it will be possible to take photographs by flash-light in the most luxuriously fitted-up *salons* without the least disturbance to the occupants. Several lamps may be used, and, in this case, they must be connected by means of a forked pipe, and ignited by a pressure of a single pressure-bulb.



Fulgur Lamp.

Another simple and effective flash-light lamp is that invented by M. Beaurepaire, and introduced by Mr. A. Leiner, of Berlin, under the name of "Meteor lamp." It is made of nickel sheet-brass, and consists of a plate-shaped receptacle containing in its centre a kettle, *b*, a concentrical groove, *a*, and, between *a* and *b*, a number of air-holes, *d*. A curved tube, *c*, leads into the kettle, *b*, and is provided at its other end with an india-rubber tube. At the bottom of the kettle a socket, *e*, is attached, by aid of which the flash lamp may be fixed to a candle-stick, &c. The groove *a* is filled with a coil of asbestos wick, which, being saturated with alcohol, affords a large surface of flame, completely and instantly burning all the magnesium powder that is



Meteor Lamp.

forced into it out of the kettle. For single portraits and small groups, from 4 to 10 centigrammes of magnesium powder, distributed to two or three lamps, will be sufficient.

## PROPOSED AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

Report of Committee, consisting of Sir H. T. Wood, Mr. L. Warnerke, and Mr. G. L. Addenbrooke, on April 13th, 1891.

The Committee appointed by the Council to consider this question have met and discussed it. Two of the members —Mr. Addenbrooke and Mr. Warnerke—attended the meeting called by Mr. Biden on the 23rd of March. At this meeting a Committee was appointed to consider the matter, and afterwards to confer with the Committee appointed by the Photographic Society of Great Britain, the general wish being that the initiative should proceed from the Photographic Society of Great Britain.

Having regard to the fact that the Camera Club for some time promoted an affiliation scheme, which has not proved very successful, the Committee do not feel very sanguine of the success of any such movement. They think, however, that it would be desirable if the majority of local photographic societies could be affiliated to the Parent Society, and they think that, if too much is not expected of the movement, such a scheme ought to be useful and practicable. A model for it might be found in the British Association list of corresponding societies, a conference of delegates from which is held annually at the time of the Association's meeting. To carry the proposal into effect, the Committee would propose a scheme based on the following considerations:—

1. That any photographic society in the United Kingdom be eligible for affiliation.
2. That the admittance to affiliation be by the Council of the Photographic Society of Great Britain.
3. That each affiliated society pay a small subscription—say 20s. per annum.
4. That a conference of delegates from each society should be held at a convenient time, of which conference the Council of the Photographic Society of Great Britain, or a certain proportion of them, should be members. The object of the conference would be to assist in promoting uniformity of work among the various societies, devising means for their mutual co-operation and intercommunion, &c.
5. That there should be a standing Committee, of which the assistant secretary of the Photographic Society of Great Britain should be secretary, he being paid a small addition to his salary for any additional work involved; that the duty of this Committee should be to facilitate communications between the societies by the interchange of papers, lectures, slides, photographs, &c.
6. Each affiliated society might have, say, two transferable tickets admitting to all meetings of the Photographic Society of Great Britain, and perhaps to the Exhibition. Possibly a reduction of the charge for wall space at the Exhibition might be made to members of the affiliated societies. One copy of the Society's *Journal* should be sent to each affiliated society, and also notices of their meetings.

A meeting in support of the scheme was held on Monday, May 25th, at the rooms of the Photographic Society of Great Britain, 50, Great Russell Street, W.C. There were present ten persons, of whom about one half were delegates of societies authorised to vote. Mr. Barrett occupied the chair. The proceedings were opened by the reading of the report of the Committee appointed at the meeting held on March 23rd. In moving its adoption, Mr. L. M. Biden regretted the smallness of the attendance. He mentioned that since the last meeting he had received communications from several societies to the effect that they would prefer to await the announcement of the Photographic Society's scheme before deciding as to their course.

The motion having been seconded, attention was called to a letter addressed to the provincial societies, dated May 13th, and signed by Mr. Biden, and which had not been read to the meeting. A heated discussion then ensued between the members of the Committee then present and Mr. Biden. The Committee repudiated any knowledge of the letter. Mr. Rumble considered that Mr. Biden had not acted straightforwardly towards the Committee in issuing the letter without their knowledge and sanction. The first notice he had of it was reading it in *Photography*. Other members of the Committee expressed similar views.

Mr. Biden excused his action on the ground that the London societies did not appear to be taking up the movement. He had received a few favourable replies from country societies. The report was then adopted, the majority of those present not voting. Mr. Biden then proposed that the Committee should form the first council. Mr. F. Brocas thought it would be against the rules they had just passed to elect the council at the present meeting. The federation should elect the council, and, as a matter of fact, no federation had yet been formed. A delegate remarked that the Photographic Society had promised a scheme of affiliation, and it appeared to him that directly the Photographic Society moved in this direction, all the societies would join it, and the federation would be without support. Mr. White asked the gentlemen representing the Photographic Society of Great Britain if they could give any definite idea of when their scheme would be completed. Mr. Addenbrooke said that the matter was being pressed forward; additional members had been appointed to the Committee, but it was not considered advisable to act too precipitately.

Mr. Biden said that before the Photographic Society could bring their scheme into operation it was necessary to alter the laws, and this could not be done before the annual meeting in February next. It was pointed out that this statement was not correct, as a special meeting could be called for the purpose at a short notice. Mr. Biden thought they would have to wait a long time for the Photographic Society to decide upon their line of action. He complained that the Society had blocked his scheme, and that it was not until he had brought the matter forward that the Society had thought of affiliation. He had spent much time and money on his project, and intended to have a federation even if he had to appeal personally to each society individually. Mr. Mackie said that the subject of affiliation had been before the Photographic Society for more than two years. As a proof that the matter was not in abeyance, he read an extract from the treasurer's last report, in which a scheme of affiliation was clearly foreshadowed. After some desultory discussion, it was finally resolved that no further steps be taken with regard to the federation unless the Society's scheme be unsuccessful, or be not brought forward.

Richmond Camera Club.—*Programme of June Meetings.*—June 5th, "Demonstration on the Use of Celerotype Paper"; June 12th, "Development of Plates with Unknown Exposures"; June 19th, "Tourist Kits"; June 26th, Result of Development Competition.

## Notes.

Photographs are so constantly being produced in law courts—the latest instance is that of a photograph of the gaming table connected with the sensational baccarat case—that it would be desirable to have some rule laid down as to their value in a legal sense. Some judges refuse to accept photographs as evidence of identity, but we presume these scruples do not extend to photographs of inanimate objects.

A tradesman in the City has put in the window of his shop, newly opened, a large photograph of "the first customer," and underneath it the real penny taken over the counter. We cannot see the attraction of either the one or the other. It is recorded that when the "Universal Provider" commenced business in a very modest way, an old lady, on being told she was the first customer, knelt down and offered up a prayer for the success of the young tradesman. If the story be true, Mr. Whiteley must regret that his stock in those days did not include photographic materials, so that he could have preserved the record of so interesting an incident in his early career.

It would be interesting to learn the motives of the Grand Duke Michael, who, disdaining to live on his wife's relatives, has resolved to take to photography as a means of earning his livelihood. Five and twenty years ago it might have been said he had rushed into photography to force his outraged relations into a recognition of his wife; now it really may be the case that he hopes to make a good income out of a recognised profession. Why does not His Royal Highness set up business in America, where dukes are scarce and much sought after?

Should the Grand Duke Michael carry out his intention, he would not be the only example of an august personage taking to the camera. The last of the Borgias, one of the most famous families in Europe, has just died in a small Tyrolese village, where for twenty years he has been a photographer. We are afraid, however, that the photographic career of the late Baron Frederick Calisto Borgia, the nobleman in question, will not be very encouraging for other scions of noble houses to do likewise, for he died in poverty, and the baroness is recommended to the charitable public by the local newspapers. Perhaps, however, the late baron was but an indifferent photographer.

In the United States, photographs in watches are becoming very popular, especially with young men who are engaged. The *New York Mail* says that one leading jeweller during the past month has taken more than five hundred orders for these horological pictures. They are of course placed in the inner side of the case. The charge is fifteen dollars, and a French photographer makes a speciality of the work. The advantage is that the picture keeps the young man straight. He is never likely to pawn a watch which has a photograph of his sweetheart inside.

Raising a ghost with a column of smoke and the magic lantern has, from time immemorial, formed a portion of the text-books on the lantern. Mr. A. W. Clayden, who read a paper "On Brocken Spectres in a London Fog" at the last meeting of the Meteorological Society, probably had this ancient "bogey" in his mind when he made his experiments with the object of raising his own spectre. He succeeded during the fogs of February last in doing this by placing a steady limelight a few feet behind his head, when his shadow was projected on to the fog. Then this shadow he photographed. Here is a hint for photographers who have a fancy for spiritualism. A more ghostly photograph, we fancy, could hardly be produced.

A "waterproof focussing cloth" which, in addition to its normal object, can be used as a camera protection against dust and rain, is useful for squeegeeing, and can be used as a shoulder cape if caught in the rain, has been exhibited at various photographic societies recently. Is this the pioneer of a sort of photographic costume for amateurs? A waterproof coat which, in addition to having a focussing-cloth cape, would also contain specially devised pockets for the camera and folding tripod, and an arrangement for changing plates, would not be altogether an impossibility. If the inside lining were of a yellow colour, a flap in the back could be made to lift up, and the whole garment could be used to cover up the window of your hotel bedroom. All you would have to do would be to lift up the flap, and there would be your dark room complete.

A photograph has been the cause of a singular libel action. Two architects were in partnership, and together designed, among other buildings, the Café Royal and the Holborn Restaurant. Two years ago the partnership was dissolved, and one of the architects sent round to various people photographs of these buildings, with a superscription, "Designed by Thomas Archer, F.R.I.B.A.," &c. Upon this, Mr. Green, his former partner, brought an action for libel, presumably because he considered that his name being left out conveyed an injurious imputation. The jury, however, were not put to the trouble of deciding this knotty point, for Mr. Justice Denman held that the libel could not be sustained.

In spite of this dictum, it cannot be denied that Mr. Green suffered an injustice. The new Copyright Bill has clauses dealing with cases where a photograph is exhibited inscribed with a name "to produce belief that the work, photograph, or negative was executed by some person who, in fact, did not execute it"; but it does not provide for a case in which the photograph induces the erroneous belief that the original was the work of the person whose name is on the photograph. Perhaps the framers of the Bill will take the action of Green *v.* Archer into consideration. It certainly contains sufficient novelty for an interesting argument as to whether the question of copyright can be so extended as to cover it.

A South African bank, so we read in the *Barberton Herald*, was lately put into a mortal fright when two big, bold, bearded men walked up to the counter and said to the cashier and clerks, "Will you step outside, please; we've come to take the bank." That the bank had been "stuck up"—to use the colonial colloquialism for robbery—was the first thought of the staff, and immediately four manly forms rose erect from four office stools, four revolvers glistened in four firm hands, four pairs of resolute eyes glared defiance. The bearded strangers shook. "Don't fire," they gasped. "We—are—the—photographers—and—want—to—take—a—portrait—of—the—bank—and—clerks." The latter put their revolvers in their pockets, came outside as requested, and were "took."

## ARCHÆOLOGICAL PHOTOGRAPHY.

### The Ypres Tower, Rye.

The pretty and quaint old town of Rye, lying in the extreme eastern corner of Sussex, close on the borders of Kent, may take rank as one of the most ancient in the first-named county, and the history of its manifold vicissitudes and misfortunes from its two-fold enemies, man, and the sea, forms a story as unique and peculiar as it is curious and interesting. Like its neighbour Winchelsea, the ocean has proved both a great friend and a great foe; although, undoubtedly, the latter town has been by far the severer sufferer of the two, inasmuch as that once large flourishing city, with its parishes, its walls, its gates, and defences, is now, with its half-ruined church, little more than the merest wreck of what it once was. Fortunately for Rye, the town itself rests upon a rocky eminence, which to the S., E., and W. is steep and abrupt, whilst to the N. and W. it slopes down to the rich alluvial marshlands at the back of the town; but a very great change has taken place on the coast, and the country surrounding the town during the last few hundred years, as a glance at the map on page 16 of Capt. Montagu Burrows' interesting work on "The Cinque Ports," will at once testify. By this we see that Rye, like the great Roman fortress of Rutupiæ, in East Kent, once stood on an island having an immense harbour, and at high-water was entirely surrounded by the sea, but now, like Rutupiæ, in consequence of the recession of the sea, it is high and dry, and the land, once under water, appears to-day as cultivated fields or rich marshes.

At one period Rye was a very important place, conducting a great trade in wine and other things with France, and stood on the sea facing the entrance of the fine harbour which formerly existed here. It suffered terribly at different times from the plague, from fire, from famine, and from foreign invasion, having been sacked and burnt more than once. Yet, like Sandwich, in Kent, the old place has pulled through it all, and still exists with its magnificent early English and Norman Cruciform Church, its ancient remains, and quaint old timber frame houses, which afford an immense attraction to the archæologist, the antiquarian, and the photographer, who will there find unending subjects for his camera. An elegant modern writer says, speaking of the Rye of the present day: "We breathe the very air of the past in these antique, roughly-paved streets. They ramble deviously up and down, hither and thither, with many an old gabled house, and strange ruins, and mouldering gates and towers. . . . Nothing more recent than the cavalier's cloak, and hat, and feathers should be seen in Rye!"*

It should be mentioned, in special honour to the old town, that before the reign of King John it was made, with Winchelsea, one of the two "Nobiliora membra Quinque Portum." Many, too, will be interested to know that Rye was very much frequented as a port of embarkation to France, and it was, no doubt, from this circumstance that large numbers of French Huguenots sought a refuge there from persecution, between the years 1562 and 1685, and many of their descendants still remain.

It is somewhat remarkable that Rye had neither walls nor gates until the time of Edward III., who ordered walls to be erected at the most accessible parts of the town, namely, the north and west sides; the natural defence of the other sides, from their steep and abrupt character, being considered sufficient. Three gates and a small postern gave access to the town, but of these four, three —namely, the postern, the Ypres, and the Strand gates— have long since disappeared; but the Land Gate is still standing, though in a somewhat ruinous condition, and still forms the entrance to the town by the London and Dover roads. But although there were neither walls nor gates until the time of Edward III., yet from the days of King Stephen (1135—1154) there existed a small but very strong castle or tower, which was erected by a great warrior, the Count William d'Ypres, taking his title from the city of Ypres in Flanders. This man was a great friend of Stephen, who created him Earl of Kent, and appointed him Lord Warden, bestowing on him both lands and lordships. After the death of Stephen, the Count was obliged to quit England, as Matilda's party were in the ascendant; and, becoming disgusted with life, he retired to the Monastery of Laon in Flanders, where he died in 1162. During Stephen's reign the Count founded the monastery of Boxley, in Kent, for Cistertian monks.

The Count seems to have exhibited considerable interest in the town of Rye, and finding that even then the town was doing a fair trade, and that, moreover, it was wholly unprotected by either wall or bastion, the Count at once ordered the erection of the tower referred to, which has ever since borne his name, and ranks amongst the oldest defence works in the county. The Ypres Tower (called by the natives the "High-press," the "Wy-pers," the "E-pers," as it happens) was built according to the usual plan of most defence works of that period, and consists of one very strong, square structure, having a round flanking tower at each corner, and is, in fact, a small castle. Each tower is 25 feet in external and 15 feet in internal circumference. There are two rooms in the building, one on the ground floor and one above, each 15 feet square. There is a door at every corner of each room communicating with one of the towers, but there is one staircase only, and this is in the N.E. tower, and does not reach the top. In the N.E. and N.W. towers are severally four lancet windows, two up high, and two lower

* "Field Paths and Green Lanes," by L. J. Jennings, Esq., M.P.

down. In the S.E. and S.W. towers there are severally five windows—three above, and two below—two on the south face, or curtain, between the towers, and one on the west. The walls are about 40 feet high, and, throughout, are said to be only 4 feet thick—not much, certainly, for an age when massive and heavy walling for defence works was the invariable rule. A sort of wing, built of rough stone, was added in 1837 to enlarge the old building, then occupied as the town prison. For about two hundred and fifty years the Ypres Tower was used as a regular fortress for defensive operations. But neither this defence, nor Edward's walls and gates, would appear to have prevented the plundering and destruction of the town by the French on two separate occasions in the reigns of Richard II. and Henry VI., *i.e.*, between the years 1377 and 1461. This structure also served as a watch-tower, for which it was well fitted, as from its summit the whole coast is visible from Fairlight Hill on the west, to Folkestone cliffs on the east, and on the south-east the coast of France can sometimes be seen; so that no sail could appear without being observed from this point, that is, if the "look-out" was long-sighted, for telescopes were not known in those days.

The site selected for this defence could not have been better chosen. It occupies the south-east corner of the town, and directly faced the entrance of the (then existing) extensive harbour, which it completely commanded, affording great protection to the town, which was always, at that period, surrounded by the sea at high tide.

The Ypres Tower has been called "Little Ease"—at least so it is said by Holloway—a name derived from a kind of boot, so entitled, which was kept there and applied as a mode of punishment or torture to criminals. This inviting instrument appears to have been a buskin of parchment put on wet, and then brought near the fire, which caused it to shrink, and so squeezed the leg sharply, giving intolerable pain. Another kind, it is said, was also used here; four thick boards were bound round with cords, two were put between the legs, and two others on the outside; the cords being then drawn very tight, the limbs were fearfully pinched, and sometimes even the bone would be broken by the cruel pressure. This somewhat resembles the horrible torture once used in Scotland, and known as the "Iron Boot."

So early as 1495 the Corporation of Rye purchased the Ypres Tower, and latterly, and for very many years, it was used as the borough goal. Recently, however, the County Council determined to build a modern prison for the town criminals, so the grim old feudal fortress is now abandoned and empty.

There have been rumours—but let us hope that they are only rumours—that this ancient fortress, now over seven hundred years old and in excellent preservation, is to be ruthlessly removed. Of course such a suggested vandalism could *only* come from the County Council, but we sincerely trust that the Corporation, on behalf of the town, will veto so cruel and tasteless a proposal.

It has even been suggested that the wretched modern brickwork surroundings should be cleared away, and the fine old Tower made an object of interest and exhibition to the public for a small fee; and, let us add, a very good idea too, by which the old fortress would not only be preserved, but made a source of small profit as well.

## EDISON'S LATEST INVENTION.

[BY DALZIEL'S AGENCY.]

*New York, May 28th.*—Mr. Thomas A. Edison, the inventor, gave to a press correspondent to-day a full description of his latest and most surprising device, called the kinetograph, which, in many respects, is a combination of the phonograph with photography. Mr. Edison said:—

"The kinetograph is a machine combining electricity with photography, so that a man may sit in his drawing-room and see reproduced upon a screen the stage of a distant theatre, may observe the actions of the actors exactly, and also hear the voices of the players or the music of an opera. So exact is the instrument that every muscle of the face and every expression is faithfully reproduced. The machine will, for instance, reproduce a boxing match. The whole scene is reproduced, every blow struck is seen perfectly, and even the sound of the blows can be heard. The kinetograph has only to be placed upon a table in front of the stage. The machine photographs the scene and records the minutest sound. It begins to work as soon as the curtain is raised, recording the motions of the actors at the rate of forty-six impressions per second. This is sufficient to give a continuous picture of what is happening. The photographic slips are then developed and replaced in the machine, and a projecting lens is substituted for the photographic lens. Now, by adjusting the phonograph, and by means of a calcium light, the whole scene may be reproduced in your drawing-room. As the impressions are permanently taken, the scene may be reproduced years later, and as many times as anyone desires to see it. The photographs are reproduced in miniature or in life-size, so that nothing of the performance need be lost."

The kinetograph, speaking roughly, is a camera arranged in a new manner to do new work. In a small box containing the camera Mr. Edison places a roll of gelatine film three-quarters of an inch wide and of any length desired. The interior of the camera is arranged in the ordinary way. The gelatine strip is unrolled from one spindle and re-rolled upon another, and it is in passing from the first spindle to the second that it is carried before the lens of the camera. The shutters of the camera are arranged to be worked by a shaft attached to a cylinder of a phonograph. This shaft also works the spindles which carry the rolls of film, and the mechanism of the camera is so arranged that when the shutters are open the spindles stop, and the gelatine film is fixed before the lens. In less than the forty-sixth part of a second the photograph is taken, the shutters snap, and the spindles turn the gelatine strip, which moves on for a new photograph. The arrangement is so complete and extraordinarily rapid that forty-six photographs may be taken in one second.

Mr. Edison took one of the rolls of gelatine film which had been through a kinetograph, and showed it to the press correspondent. Upon it was photographed one of the boys employed in Mr. Edison's laboratory. The photographs were about half an inch square, taken on the film at intervals of about one inch. They represent the boy in the act of taking off his hat and bowing. Between the first view and the last of the series, the complete motion of removing the hat and making the bow was clearly discernible, and there was no apparent change of position between any two consecutive views. The boy's hat was upon his head in the first view, and his hand was at his side. The hand was gradually raised toward the head, which gradually inclined forward, the hat was removed, and the bow completed, after which the hat was placed upon the boy's head. Mr. Edison showed the machine to the correspondent, and to a layman. It appears to be simply a square box, in the upper end of which is a hole one inch in diameter. In the hole is a lens, and on the bottom of the box within is arranged a series of wheels and spindles, upon which the rolls of gelatine film are placed. The film is carried from one of the spindles over the wheels, past the lens, to the other spindle. Fastened to the latter spindle is a belt, which is attached to an electric motor. When the motor is started, the roll of gelatine is transferred from the first to the second spindle, and in the transfer is passed before the lens, and the photographic impression is taken.

The film comes out perfectly when run at the highest speed. The correspondent could see the boy distinctly waving his hand and touching his hat. The lad laughed, shook his head, and bowed. The gelatine film could be seen in rapid motion, but the figures of the boy were always before the lens, and every motion was natural and perfect.

Then Mr. Edison attached the projecting lens to a screen, when the figure came out life-size, every feature being distinct, and the action of the muscles perfect. Mr. Edison slowed the machine down and the difference was apparent, the action of the boy becoming jerky. It was by constantly increasing the rapidity of the machine that the inventor finally determined the fact that forty-six photographs per second are the proper number for the exact production of ordinary motion.

Mr. Edison intends to reproduce an entire opera by means of this invention. He does not mean to show it in miniature, but will represent the stage with the actors moving, speaking, and singing. The players will be life-size, and the music will be exactly reproduced. The result is a gigantic photograph, not merely of the actors, but of the entire stage, scenery, and furniture.

## MOONLIGHT PHOTOGRAPHY.

BY E. B. LUCE.

A brief note in regard to moonlight photography which appeared in recent issue of the *Times* reminded me of my own experience in that line seven or eight years ago. Perhaps it may be of interest to some others.

I believe I had heard of some one trying to take a picture by the light of the moon, but had read of only one such instance.

I had just started in the business then, and photography was a pastime to me instead of an occupation—so I was ready for any experiment. I used a half-size Voigtlander portrait lens, and selected for a subject the house of our nearest neighbour, some two hundred feet distant. At that distance I secured a tolerably good focus on the house with the lens wide open, although the near trees and distant objects were considerably out of focus. We did not have as rapid plates then as are made now. I made an estimate of the exposure likely to be required, based on the comparative brightness of sun and moonlight which I had learned in the study of astronomy, and, strange to say, my first plate was correctly timed.

Any photographer can easily see that a portrait lens wide open would work with extreme rapidity in outdoor work in strong sunlight, but that plate was exposed about three hours in the light of a full moon in a cloudless sky. There were lights burning in the house, which showed plainly in the picture. The exposure was commenced about nine o'clock p.m., and continued until midnight, so there could have been no daylight on the scene. I think the two sides of the house that were visible in the picture were in the direct light nearly all the time; of course, the shadows shifted some—as the moon travelled along its path —which gave a soft effect, no sharp edges to the shadows.

Several young people spent a very pleasant evening, promenading before the house and sitting out among the trees, and one young lady, dressed in white, stopped long enough in one place to make an impression easily seen.

The greatest surprise to us in the result was the very near resemblance to a daylight picture, the soft shadows being the only difference we could detect. Something of a moonlight effect was secured by printing the whole rather dark, and the sky much darker.

I made one or two other attempts, but none were more successful than this.—*Photographic Times.*

## PHOTOGRAPHIC METHODS OF OBTAINING POLYCHROMATIC IMPRESSIONS.*

BY LEON VIDAL.

Since the object is to correct the inaccuracies due to ordinary plates, it is necessary, at the outset, to have a clear idea of the subject to be copied, so as to select a suitable method of orthochromatising the plates. The example just given shows clearly the line to be followed, and it is evident that if the subject only contains blue, yellow, and green, and combinations of these three colours, it will be sufficient to use a plate sensitised for yellow and green.

The eye can judge very well of the relation between the tints of the copy and those of the original, and if the correction above referred to be not satisfactory, one can alter the formula or the screen, and prepare a second negative which shall be nearer the truth. A few trials are of little account when it is a question of doing a piece of work satisfactorily. We insist greatly on the pains which it is necessary to take in the preparation of the negative, because it is on that part of the work that the final result almost entirely depends. It is easy to see, for example, that, if the red has not sufficiently acted upon the plate, the latter will be too transparent in the corresponding portions, and the colour lying beneath will be smudged. The tonality must be accurately rendered to avoid this defect.

The negative having thus been obtained under suitable conditions, it now remains to produce the coloured effect. Several photographic methods may be used, but the two which are especially suitable are collotype and Woodburytype.

As regards the colours lying beneath, we think that chromo-lithography is the method which is of most commercial value. If the final printing is to be done by means of collotype, the following is the procedure. A collotype plate is prepared from the negative, and is inked in with thin red or blue ink, and impressions are taken on transfer paper equal in number to the different colours which one wishes to use. These impressions are transferred to as many grained or polished lithographic stones. The lithographer thus has a design absolutely identical with the original transferred to his lithographic stones. We omitted to recommend that two registering crosses be drawn on the collotype plate with a solution of tannin or gallic acid. This coagulates the gelatine, or causes it to take the ink in the same way as the parts which have been exposed to light.

The separate stones are prepared as usual with black lithographic ink, after careful study of the original and of the transfer. In certain cases flat tints may be suitable, but the colours should be graduated to follow the original, which is an essential condition. The flat tint is in all cases necessary where photography has reproduced a colour the brilliance of which is equivalent to pure white. Thus, if the original is a portrait of a lady wearing a black satin dress, the high-lights produce in the negative intensely black effects, which in the positive becomes pure white. This is an inaccuracy which orthochromatic photography cannot correct. All that could be done would be to over-expose, a remedy which is worse than the trouble to be avoided, as it would produce a monotonous effect over the whole proof. It is better to remedy this defect by means of a local flat tint. Black

* Continued from page 404.

satin, even where it reflects the brightest light, does not appear to be a pure white; in order to be assured of this, one only has to bring near to it a piece of white paper. One will at once see beneath the colour of the satin a sort of light grey colour, which indicates the exact value of the flat tint. It is necessary that the flat tint be under the whole of the design to which it refers. It will be just the same for all the other colours when they produce similar effects. Having finished the colour-stones and the collotype, we proceed to take a proof. It is even better to pull first a light collotype print on white paper, and then to print the colours on it. The first proof serves as a guide, and one ends nevertheless with a collotype impression of the required tone and colour.

This first attempt, which will itself be very pretty, thanks to the irreproachable accuracy of photographic processes, may require slight correction with regard to the distribution and combination of the colours. This, however, is easy, and it will rarely be necessary to make a third trial.

This is, in short, chromo-lithography, in which photography has taken a leading part and done the most difficult portion of the work, giving effects which could only have been otherwise obtained by the employment of highly skilled artists, who would have interpreted the original rather than copied it.

[As examples, coloured facsimiles of Gobelin's tapestries, representing (1) An Audience of Louis XIV. and Cardinal Chigi, and (2) The Triumph of Bacchus, were shown, and also the original collotype of the latter.]

This method can be applied to all coloured subjects which contain no metallic effects. When the latter are present this method fails. Greasy inks, being wanting in transparency, do not lend themselves to the reproduction of metallic subjects. They smudge the surface and reduce the brilliancy, and fail entirely to convey the impression given by the metallic object itself. Only a vitreous ink will suit in this case, and the only method which will give good results by a mechanical process is to prepare Woodburytype prints with gelatinous ink.

For the preparation of the underlying colour print are used not only metallic powders—gold bronze, silver bronze, copper bronze, &c.—but also thin leaves of either bright or dull metal, which give more brilliancy, more metallic solidity, and truer effects. They are applied to the paper by means of lithography, but the paper should be prepared in the method suitable for the Woodburytype process. The impressions are taken on the coloured print, making use of registering marks in the same way as in chromo-lithographic printing. At first sight this seems difficult, but the manipulative skill is easily acquired, and the register is perfect. We have in this way prepared beautiful prints, which could have been produced by no other method.

[The examples shown to illustrate this part of the paper were—

1. The chromo-lithographed portion of a Limoges enamel, and the same with the Woodburytype superposed on it.

2. A Woodburytype from a Limoges enamel representing the "Toilet of Psyche," the coloured design of the same, and the final result obtained by their superposition.

3. The Woodburytype of a jug, and the complete picture obtained by superposing this on the coloured design.]

For a limited number of impressions the carbon process might be used; but here we are leaving commercial methods, and therefore we shall not consider it in detail.

*(To be continued.)*

# Patent Intelligence.

### Applications for Letters Patent.

8,834. Frank Sternberg, Hillside Cottage, Bushey, Herts, "A Process for Producing Photographs."—May 25th.

8,865. Frederick Winterhoff, 3, Ashmount Road, Tottenham, "A New and Improved Process for Producing Glass Printing Plates to Transfer from on to Lithographic Stones, Zinc, Glass, or any other Material."—May 26th.

8,934. Henry Grant Madan Conybeare, 24, Southampton Buildings, London, "An Appliance for Attaching Tubes or Cylinders to Flat Surfaces, Primarily Applicable for Attaching Photographic Lens Tubes to Cameras."—May 26th.

8,950. Benjamin Constant Le Moussu, 323, High Holborn, London, "Improvements in Photo-Etching."—May 26th.

9,015. William Heath, 28, Southampton Buildings, London, "Improvements in Photographic Cameras."—May 27th.

9,042. Edmund Hawthorn Micklewood, 5, St. Michael's Terrace, Plymouth, "An Improved Photographic Shutter."—May 28th.

9,104. Ernest William Harvey and Charles William Alldred, 39, Alderbrook Road, Balham, London, "Improvements in the Manufacture of Electric Light Carbons."—May 29th.

9,129. Frederick Oatley Bynoe, 7, Southampton Row, London, "The Revolving Reservoir Hand-Camera."—May 29th.

### Specifications Published.

239. *January 7th*, 1890.—"Photographic Camera and Change-Box. W. S. Rogers, 7, Addison Road, Bedford Park, Chiswick, Middlesex.

The camera belongs to the detective class, and consists of a box divided into compartments for the lens, the dark chamber, the storage chamber for the plates, and for receiving the flexible shutter. To expose a plate, it is dropped, by inverting the camera, from its groove into a light-tight sheath, which has been previously turned about the axis on one end into a vertical position. The shutter is then moved till the end of the sheath comes opposite the end of the exposure groove, into which the plate is dropped by restoring the camera to its original position. By reversing this operation, the plate, after exposure, is restored to its groove in the store chamber. The plates may be placed in metallic sheaths. Part of one side of the sheath is made flexible to enable the plate to be retained in it by the pressure of the finger. A ratchet or pointer indicating arrangement may be fixed to enable the sheath to be placed accurately over any of the grooves.

# Correspondence.

### "SUN ARTISTS."

Sir,—As we were rolling easily along the high road, conscious that already some measure of success had resulted from our uphill journey, an ill-favoured fellow, masked, armed, and calling himself "Helios," appearing out of a thicket hard by, suddenly presented himself at the window, and levelled a pistol at our heads. His demand was exacting, nothing less than the life of our serial. This is the penalty of those who ride in coaches. *Vacuus cantat coram latrone viator.* However, we preserved a cool front, for our weapons were more modern than his appeared to be. We accordingly refused to settle it in the thicket (where, doubtless, other fellows of his kind were ready to assist him), preferring, rather, the vantage ground of the highway, on which we had so far jogged with safety, and for the public good. We also shrewdly called to mind an old fable, in which a certain animal parades in the skin of a lion, and concluded that he who calls himself "Helios" when dealing with a photographic subject, can hardly be as great as he seems. We have suffered much in the cause of seeking wider appreciation for photographic art, but never until now have we come across what I will bluntly call an attempt at assassination. Were not others as well as myself concerned, I should be content to let "Helios" sink into oblivion unassisted, if, indeed, he is not already an extinct sun, whose power for good or ill has ceased.

Whatever his history, I beg of you to allow me to deal briefly with his communication to your columns.

The inference that Mr. John Addington Symonds is incapable of elucidating his subject, or that photographers cannot learn very much from the article in question, needs little notice, for Mr. Symonds' position as an art critic is too well established to be affected in the slightest degree by the opinion of so shallow an observer as "Helios." To say that it is "moderately well written, but hesitating," is simply a contradiction of terms. A further proof of the weakness of "Helios'" position lies in the fact that, so far from being in "difficulties as to what to say" ("Helios'" words), Mr. Symonds has kindly *volunteered* to give us another article for a future number.

Again, "Helios" alleges that I neglected to correct an alleged error. He complains that Mr. Symonds speaks of Mrs. Cameron as the first to make subject-photographs popular in England, and that I did not correct him, and point to Messrs. Robinson and Rejlander. This is practically the only complaint that "Helios" details, and, consequently, the only one necessary to go into fully. It may, however, be observed in passing, to show the value of this criticism, and to throw a light on the spirit in which it is written, that, in a number devoted to Mrs. Myers, "Helios" can only find a statement concerning Mrs. Cameron to cavil at. I now beg to refer "Helios" to page 38 of *Sun Artists* (No. 5). He will see that, so far as Mr. Robinson's subject-photographs are concerned, we have fully recognised their priority. I beg further to say that Mr. Symonds had that number under his notice when he wrote the words in question. The whole matter turns on what is understood by the word popularity as applied to art. "Helios" couples the popularity of Mr. Robinson's earlier pictures with nigger minstrels. I daresay he is right. But I do not remember seeing a more impertinent paragraph in a newspaper than the one in which "Helios" blames me for not asking Mr. Symonds to lower his conception of that word to such a level. I do not wish to be misunderstood. I am now talking only of Mr. Robinson's earlier work. His latest work is of its kind unequalled, and I feel sure Mr. Symonds, who is not by any means so ignorant of photography as he professes to be, would appreciate it. What I have said with respect to Mr. Robinson's early work applies to nearly all of Rejlander's work that I have seen, and, from what I hear, to all the rest. The exhibition of his works at the Camera Club only too clearly showed their ephemeral nature, and when contrasted with Mrs. Cameron's pictures, which were shown in a similar way, the enormous difference between them was very apparent.

I now pass on to another matter. The suggestion as to the course we should pursue, from the mouth of an anonymous writer, whose only claim to consideration is the envy, hatred, and malice of his contribution, is only equalled in insolence by the reflection (based on the arguments disposed of above) as to the good we are doing to artistic photography. We are quite content to leave this question with a public that is rewarding our efforts by an ever-increasing support, and whose verdict is practical and alone worth serious consideration. "Helios" can well afford, holding the opinions he does, to ignore our existence as much as his deserves to be ignored. Nothing more need be said on this point, did he not also favour the world with his views on our "decadence"; and, as he has indicated the point where it commenced, it may interest him to learn the following facts, bearing in mind that humble adage, "the proof of the pudding lies in the eating." In fact, the public demand is a safe criterion of the value of our efforts. Taking, as a basis, the quarter during which our first number was published, our average sales during the first four numbers showed a total improvement of five per cent. Then came the "decadence" with No. 5, and its violent, controversial, and most ill-advised essay (the adjectives are sunbeams). This was published in the fifth quarter, and the sales immediately rose thirty-five per cent. above the said improvement. Again, when No. 6 was issued they rose a further twelve per cent., beyond which point we have as yet no statistics. Thus, it is exactly the period of "decadence" which has been most fruitful in public appreciation. We now stand with sales per quarter about fifty-two per cent. above those we started with. Had it been otherwise, perhaps "Helios'" wish would ere this have been fulfilled.

Finally, I cannot but call indecent all these expressions, so cheap in utterance, which, trying to injure the Sun Artists' Association, and myself personally, cast reflections on an eminent lady photographer and a distinguished art critic who has condescended to throw on photography a glance perhaps more worthily bestowed elsewhere. It is an unfortunate fact that photography creates more lowness of mind than any other pursuit. I am patiently awaiting the day when Alphonse Daudet, seeking our shores in search of fresh material, will see fit to immortalise "Helios" and those of his tribe in a continuation of "Jack." I am also painfully aware that there is another opposition to our efforts which finds expression in a different manner. I have come to call it the "amateur trade" opposition, and it arises from the fact that our price is low and our value good. The rest is explained in my name for it.

As I finish this letter, the post brings me in an extract from an article on our new number in the *British Journal of Photography*, which concludes as follows:— "The essay will prove of much value to photographers. The author's ideas are clearly and temperately expressed." Would that so favourable a memento might truthfully be engraved on the tombstone that so soon will cover "Helios"! W. A. Boord.

*June 3rd*, 1891.

## Proceedings of Societies.

### Camera Club.

On May 28th, Mr. A. Pringle in the chair, a paper communicated by M. Leon Vidal was translated and read by Mr. Lyonel Clark. The subject was "A Method of Mechanical Colouring for Carbon Transparencies, Stereoscopic Views, and Lantern Slides."

This paper was followed by the reading of one sent by Prof. W. K. Burton upon "A New Emulsion for Printing-out Paper." The communication was illustrated by some good examples on Whatman paper, sent by Mr. Burton. The process consists in preparing the salting and sensitising solutions in one emulsion, on which the paper can be floated, or the solution can be brushed on. It was fully described, and the formulæ given for thin, medium, and strong negatives respectively. Some discussion followed, in which Messrs. Warnerke, Clark, and the Chairman took part.

During the evening, Mr. Woodward demonstrated Schoppen's method of viewing lantern pictures stereoscopically by means of coloured glasses.

### Holborn Camera Club.

On Friday night last a large number of hand-cameras was shown. Messrs. Adams and Co. sent a representative, who explained the nature of the working of the "Ideal"; Mr. Benest showed Robert's hand camera, and Mr. Chang the "Eclipse" and "Diamond" hand-cameras. The novelty of the evening was, however, a stereoscopic hand-camera shown by Mr. Raphael, which, by a sliding arrangement of the front, could be used as a quarter-plate as well as a stereoscopic hand-camera.

Mr. Arthur R. Gowing was elected a member of the Club.

### Sydenham Camera Club.

At the meeting held on May 29th at the "Greyhound" Hotel the President took the chair.

Mr. T. Rumble reported that he and Mr. Gray had attended the meeting of delegates at the rooms of the Photographic Society of Great Britain to discuss the federation scheme, and that it had been decided that nothing should be done until the parent society had brought forward its scheme of affiliation, or had abandoned it altogether.

Mr. Reynolds read a paper on "The Dark Room and its Appliances." The paper was illustrated with a number of diagrams showing the best means of ventilating, lighting, and arranging the dark room. Mr. Reynolds was of opinion that electric light was the best for the dark room, though, at present, this was out of the question for most amateurs.

It was announced that the first summer excursion would take place on June 6th.

HACKNEY PHOTOGRAPHIC SOCIETY.

A MEETING was held on Thursday last, Mr. BECKETT presiding.

Mr. BECKETT gave a paper on "Elementary Work," and gave as his preferences a quarter-plate camera, single lens, one-and-a-half or twice length of plate, half-plate tripod for quarter-plate camera to ensure greater rigidity, and the slowest plate that could be obtained. For development he preferred pyro, and gave as an excellent formula:—

| | | |
|---|---|---|
| A.—Pyro | ... ... ... ... ... | 1 ounce |
| Sulphite soda | ... ... ... ... ... | 3 ounces |
| Citric acid... | ... ... ... ... ... | 16 grains |
| Water to ... | ... ... ... ... ... | 16 ounces |

B.—Saturated solution carb. soda with sal ammoniac, or roughly for saturation, 6 ounces sulphite to 1 sal ammoniac.

For use—

| | | |
|---|---|---|
| A ... | ... ... ... ... ... | 10 minims |
| B ... | ... ... ... ... ... | 1 drachm |
| Water | ... ... ... ... ... | 1 ounce |

He had found a mixture of eikonogen and hydroquinone work well and very nearly equal pyro. For exposure the best method was by making notes of those plates which had been exposed and comparing.

Dr. ROLAND SMITH said he had found a good way of bringing out under-exposed plates was by first using pyro and then following with quinol.

A discussion then ensued, in which Messrs. Grant, Gosling, Dean, Gregg, Barton, and others took part.

RICHMOND CAMERA CLUB.

AT the meeting on the 29th ult. Mr. FORD presided.

Mr. KIDD showed and explained the "Adams" hand-camera, and handed round some negatives taken with it during a recent Continental trip.

The subject for discussion was "Finishing and Mounting Prints."

ROYAL MICROSCOPICAL SOCIETY.

AT the last meeting of this Society many items of photographic interest were referred to. In the first place, Mr. Grenfell exhibited a photograph, taken by Mr. Nelson, of a small organism found a short time ago, the nature of which he had been as yet unable to determine, some of the best zoologists and botanists to whom he had shown it being unable to say whether it was vegetable or animal in its nature. The whole of the details were brought out in such a way as to afford a striking instance of the value of photography for such purposes. He also wished to mention that at the present time, in the Botanical Gardens (and, he also believed, in the boating-pond), Regent's Park, there were considerable numbers of a free-swimming infusorian known as Tintillus, formerly described by Claparède. It was remarkable for its chitinous lorica, a specimen of which he had brought for exhibition, the creature itself not being easy to exhibit in consequence of its rapid movements. Claparède mentioned its having been found at Berlin; but hitherto it had only seemed to be found in sea-water.

Mr. E. M. Nelson read a note on the subject of "Lateral Development in Photography," advanced by Mr. Pringle in his note printed in the *Journal* of the Society for April last, pp. 263-264. He had tried many experiments, leading to the conclusion that Mr. Pringle was wholly mistaken in supposing that the width of a flagellum is increased to an extent at least fifty per cent. by lateral development. If lateral development of this kind occurred, it would eat into the image of the flagellum on the negative, and so make it thinner than the image on the screen; but when the negative was printed, this lateral development would act in the opposite direction, and if the actions were equal in extent, the size of the flagellum would be restored to the original size of the image on the screen. In no case could the action of the lateral development on the negative and on the print be cumulative. Mr. Nelson considered it highly important to dispose of the lateral development theory, for if such an error were allowed currency without challenge, it would very soon be said that a photo-micrograph, on account of this lateral development, had no scientific value.

Mr. NELSON also read a short paper "On the Use of Monochromatic Light in Microscopy," and exhibited and described the model of a new and simple apparatus for obtaining the same by means of a glass prism.

Mr. MAYALL said he recollected the original apparatus designed by the late M. Prazmowski at the time he was in partnership with Hartnack; it was troublesome to manage, so that not very much was done with it. That made by Zeiss, later on, was practically the same thing. He thought, however, that the apparatus before them was very likely to do good work, and the facility with which the prism could be turned, and the illumination varied from one end to the other of the spectrum, at once commended it to notice. He understood Mr. Nelson to say that by changing the monochromatic light from yellow to blue, the resolving power of the objective could be plainly seen to be augmented by any amount equivalent to ·1 N.A., and that in many cases an ordinary achromatic objective produced images as perfect as those given by apochromatic objectives. These were points of special scientific interest. He should not be satisfied, however, until Mr. Comber had seen it and put it through its paces, using sunlight, because now they were not content with mere performance with the microscope, but they must have good photographic results as well. Of course, to be of permanent value, the apparatus must not be made of wood, as in the model. There would be no difficulty in adapting an inexpensive form of spectroscope for the purpose.

Mr. NELSON also described a new projection microscope fitted with a special condenser made of three flint lenses, so as to embrace the whole cone of 82°. The only novelty about it was the system of collecting the light, by which a beam of $4\frac{1}{4}$ in. was brought down to one of $1\frac{1}{4}$ in., and by passing through the two lenses placed in a water trough, a beam of parallel rays of great intensity was obtained for use in projecting the image upon the screen. It was necessary to have a different condenser for each objective, as the one must be perfectly adapted for use with the other. He had at present only two, one being for use with Zeiss's A A, equal to about an ordinary 1 in., and the other being a lower power. With the former of these, Mr. Nelson then showed the following slides upon the screen:—Stem of equisetum, stellate tissue of rush, foot of dytiscus, foot of caterpillar, echinus spine, orbitolite, section of limestone and coralline, ovary of poppy, section of mistletoe, section of tooth, section of scalp, trachea, floridiæ, dog flea, earth-mite, hairs of caterpillar, young chick, polyzoa, Ophiocoma, neglecta, and a spiracle. The following were afterwards shown with a lower power:—Tortoise beetle antennæ, larva of potato-beetle, trap of British trapdoor spider, and leg of cricket.

The PRESIDENT said he had been very much struck with the beauty of the views which had been shown, and thought that it would be a great acquisition to anyone who wanted to give exhibitions of microscopical objects. Very few schools should be unprovided with such an apparatus. He was sure those present felt greatly obliged to Mr. Nelson for what he had shown them.

Mr. MAYALL said that some seven or eight years ago, when Dr. Hugo Schroeder first came to England, he gave a description of a microscope for projection purposes which he had devised, examples of which were in use in Germany and in the United States. Figures of this instrument had been given in the *Journal* of the Society, and Mr. Crisp had been so much struck with the importance of having such an instrument for use at the Society's meetings, that it was decided to order one, and, if it proved successful, the Society would have been strongly advised to acquire one. Unfortunately, however, from various causes, the order had never been executed. The intention in Dr. Schroeder's apparatus was much the same as hat of Mr. Nelsou, though the plan of the latter was much less ambitious and much less expensive. He thought Mr. Nelson was rendering valuable services to microscopy in working out these improved forms of condensers for projection apparatus. The images he had shown upon the screen were very clear, sharp, and luminous, comparing most favourably with the exhibition made some time ago at the Society by Mr. Lewis Wright. He might also say that Mr. Nelson's projection images were far superior to anything shown at the Crystal Palace and elsewhere, with microscopes said to magnify fifty thousand diameters. It was interesting to note the extent of sharp field given by objectives of different construction; the projection images enabled the observer to select different qualities of objectives with great facility. He hoped the Society's funds would soon enable them to acquire such an instrument for practical demonstrations in illustration of papers at the meetings—a point which Mr. Crisp and he had long regarded as worthy of the Society's most careful consideration. The possession of a projection lantern for exhibiting photographs, &c., on the screen was, of course, involved in the equipment required by the Society; but the projection microscope itself, with which microscope objectives could be employed effectively, was the essential thing required.

### Glenalmond Photographic Club.

At the meeting held on May 30th, the chair was occupied by the President, who remarked that the Club had to decide upon the subject of a photograph, for which a prize would be given by one of the masters of the college, which, it was decided, should be for the best set of three photographs of river or burn scenery within walking distance.

An inspection then took place of some photographs shown by the President and Messrs. Maxwell.

### Lowestoft and District Photographic Society.

A meeting was held on the 29th May, at the School of Art, Regent Road, Mr. W. Stringfield presiding.

Prints and slides were exhibited by Mrs. J. Lee Barber, Messrs. Estcourt, J. Rose, A. M. Smith, W. R. Smith, and others, and discussions thereon followed. The evening's exhibits included the stereoscopic "snap-shots" of different parts of London, taken from the top of an omnibus by Mr. Estcourt; lantern slides of Old Lowestoft taken from negatives forty years ago, shown by Mr. James Rose; Mr. A. M. Smith's slides of the neighbourhood; and a few photo-micro slides by Mr. W. R. Simpson.

### Liverpool Amateur Photographic Association.

*May 28th.*—Mr. Paul Lange in the chair. The following were elected members:—Messrs. Thomas Rome, Anthony Dod, John Wells, and F. E. Patchett.

The Chairman reported on the excursion to Chirk, which took place on May 9th, when twenty-one members attended, and, although the day was dull, some good photographs were taken.

The Hon. Secretary exhibited the London Rubber Co.'s new water-proof focussing cloth; Mr. B. Boothroyd, Chadwick's new hand-camera fitted with Swift's special lens working at $f/4$ ($4\frac{1}{2}$ inch focus).

Dr. Manton, president of the Sheffield and District Optical Lantern Society, then gave a paper and demonstration on "The Carbon Process."

### Photographic Society of India.

*March 26th.*—"Photo-Micrography." A practical description of the process of photographing the microscopic image was given by Mr. J. J. Meade, of which the following is a brief summary.

Micro-photography is usually understood to mean the process by which ordinary photographs are taken, but so small in size as to be visible only by means of the microscope. During the Franco-Prussian war, despatches were photographed in this manner, and sent in quills by carrier pigeons. The photographs, on arrival, were placed under a microscope used in connection with the optical lantern, and projected on a screen, the result being a magnified image of the original MS.

Photo-micrography, on the contrary, is the process by which the camera is used, in connection with the microscope, to secure a true picture by means of photography of a natural object of microscopic dimensions. The manifest advantages which this latter process has over the antiquated method of drawing is so great that it is now practised universally by all the leading microscopists of the day, for a photograph properly taken cannot be other than a true picture of the original object; whereas the "artistic effect" which may undesignedly creep into a pencil drawing can only render it valueless as a true record of what is invisible to the unaided eye.

The following may perhaps be of service to those wishing to work at photo-micrography, they already being well acquainted with photographic manipulation. The apparatus required by a *beginner*, in addition to his camera, &c., would be a microscope with, say, two objectives, of one inch and one-quarter inch respectively, with two eye-pieces, say A and C, a bull's-eye condenser, a stand, and a common flat wick kerosene lamp as "squat" as possible.

The microscope should be of the "Student's" type, of English, and not Continental make. The body of the instrument should be made to incline to any angle between the vertical and horizontal. The objectives should have the "universal" screw thread, and the substage fitting should be of the "universal" size. Objectives and sub-stage apparatus subsequently purchased according to requirement, may be bought from any English dealer, and, if ordered of the "universal" size, will fit the microscope. As the objectives are adjusted and intended for use with an eye-piece, the latter should always be used for photography.

It is preferable to "expose" at night, as this ensures the light always being the same.

The apparatus is set up as follows:—The camera lens is removed, and the object to be photographed having been clamped on the stage of the microscope, and then focussed, the body of the microscope is inclined to the horizontal position, and the eye-piece end inserted into the camera in the aperture usually occupied by the photographic lens. Care must be taken that the plane of the ground glass of the camera and the micro eye-piece are parallel. The junction between the camera and the microscope must, of course, be made light-tight. The lamp, *with the flame edge on*, should now be placed about a foot away from the microscope, but in a direct line with it, the plane being in line with the object to be photographed. The sub-stage mirror is turned away on one side, and the flame of the lamp is focussed on the object by means of the bull's-eye condenser. The object should now be visible on the ground glass of the camera. Amplification is obtained by drawing out the bellows of the camera, and focussing is done with the fine adjustment of the microscope, which should also have a "coarse adjustment."

Exposure and development are carried out in the usual manner.

Beginners should commence by using, say, the one-inch objective with the A eye-piece on the microscope, working on microscopic specimens which do not exhibit too much intricate detail.

### Photographic Society of Philadelphia.

At the meeting held on May 13th (Mr. John G. Bullock in the chair), the Board of Directors presented their monthly report, reported the purchase of a fine pair of dissolving optical lanterns, including five pairs of lenses of various focal lengths, suitable for rooms or halls of any size; and additions to the library were announced.

The President announced the appointment of a special committee to take into consideration the feasibility of starting a movement looking to a uniform method of marking the sensitiveness of dry plates.

Mr. John Carbutt exhibited a Watkins exposure meter, respecting which considerable discussion ensued.

Mr. Cheyney said there was an article in the current number of *Anthony's Bulletin* on the subject of exposure meters, which seemed to him more rational than any of them. The inventor of the meter referred to coats the bottom of a brass tube with luminous paint, which he exposes to the light the picture is to be taken with. Then a cap is placed on the tube, and through a small peep-hole the time it takes the luminous paint to fade is noted. This luminous paiut is affected eutirely by the blue rays, and a very close approximation can be made as to the proper exposure to be made.

The Chairman said he did not think it could be depended on. The same batch of paint might be constant, but no two batches would be alike.

Mr. Ives remarked that the time in which this paint lost its luminosity depended upon the temperature. If it was warm it lost it quicker ; if cold, it held it for a long time.

Mr. Stirling thought in that case one would require a series of comparative tables. When the thermometer was 32°, so much ; when 70°, so much. Mr. Taylor suggested that it was something like Captaiu Cuttle's watch.

Mr. C. E. Hopkins exhibited a new shutter, called the "Pueumo," of the rotary type, which could be placed either outside or iuside the lens, aud iustautaneous or time exposures could be made at will. Prints made on the Omega seusitised paper were next showu and toned by Mr. Hopkins. The paper is coated with a gelatine emulsiou, and priuted iu sunlight, requiriug about one-third less time thau ordinary albumenised paper. A combined toning and fixing solution is sold for use with the paper, or a formula for preparing the same is furnished with each package. A satisfactory black tone can easily be obtained wheu desired, or by stopping the toning at an earlier point warmer toues are obtained. The print should be made considerably darker thau the fiuished tone desired, aud immersed in the toning solution without first washing, being left therein until the desired tone is obtained, and theu well washed in several changes of water. They may be mouuted directly after washing, or can be hung up to dry or laid face up on blotting-paper, care beiug takeu not to place anything on the top of the prints till thoroughly dry, as it would adhere to the gelatine surface. The prints can be glazed by squeegeeing them face down on a tin-type plate. It was claimed that the paper was more permanent thau albumen paper, aud would not fade if properly used.

Mr. Bell took exception to the toning and fixing in one solutiou ; the prints so treated would fade. In the olden time they were taught to toue separately and fix separately if they desired to get permanent priuts, and the mixture of the gold and hypo together looked as if they were going back to the old fadiug time.

Mr. Hopkins said he had not found this to be the case. The prints in the sample book shown had been made for over a year, and they were just as good now as when they were first made.

---

Photographic Society of Great Britain.—June 9th, at 8 p.m., adjourned discussion on M. Vidal's paper ; Mr. L. Waruerke ou "A New Sensitometer"; Capt. Abney on "Dark Room Illumination." June 23rd, subject for discussion, "Orthochromatic Photography." The exhibition of chromo work will remain open till end of this mouth.

Manchester Amateur Photographic Society.—The next meetiug will be held at the Manchester Athenæum, ou Juue 9th, when Mr. W. Stanley will read a paper on "The Camera," aud Mr. F. W. Parrott one on "The Leus." Members are requested at this meetiug to exhibit uegatives and prints which they may consider suitable for the "Survey" collection.

A Reducer.—M. L. Belitski recommends a very practical reducer, consistiug of a solution of 10 parts of ferrous oxalate of potassium in 200 grammes of water, to which are added 8 parts of sulphite of soda, 2½ to 3 parts of pulverised oxalic acid, 50 parts of hyposulphite of soda. Keep in obscurity.—*Photo. Wochbl.*

Mr. Valentine Blanchard's Lectures at the Polytechnic came to a termiuation last week, aud have beeu considered so successful that there is a strong probability that they will be reuewed uext winter. They were profusely illustrated by the aid of the optical lantern, and besides the old masters, selections from the work of Robinson, Rejlander, Adam Salomon, Van der Weyde, Lyd. Sawyer, P. Gibson, F. Sutcliffe, Gale, Austin, Bright, and many others were thrown on the screen. The last lecture dealt with art in portraiture, aud was highly appreciated.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

Celluloid.—*Cuprammonium as a Solvent for Cellulose.* It is possible that your failure may be attributed to the use of an impure preparation ; for it is known that by adding ammouia in excess to sulphate of copper, a solution is obtained which does *not* dissolve cellulose, because of the large amount of ammonium sulphate present in the liquor. Use ouly so much ammouia, in the first instance, as will precipitate the blue hydrate, collect this ou a filter, wash with water, and then stir it up with fresh ammonia until dissolved.

C. J. S. (Temple). — *Reproductions.* Make euquiry of the Autotype Company, 74, New Oxford Street, W.C. ; or write to Mr. Edward Dunmore, Keutish Town Road, N.W.

J. R. (Swansea).— *Studio Blinds.* A few words by way of report will be satisfactory, and let us hear in the event of your desiring further particulars.

J. C. S. (Birmiugham).—*Unmounting Photographs.* We should anticipate no difficulty iu getting the gummed photos off the paper or card by soaking them in warm water and gently raising them with a bone spatula ; but going once through the roller press makes it troublesome and uncertain.

Metro.— *Degrees Centigrade.* See the thermometer table at end of the Year-Book. 15·5° C. corresponds to 60° F., and 21 C. to about 70 Fahrenheit. The Reaumur scale is never employed in this country, being too opeu for general use, but survives in certain districts of Germany.

A.M.—*Reducing Hypo Residues.* Instead of throwing down the silver as sulphide, you may employ M. Davanne's method of immersing a copper plate, but the resulting metallic silver is seldom pure. It nearly always retains a certain amount of copper, so that the nitrate made from it has usually a blue tinge.

P. McG.—*Judging Distance.* You have beeu inventing over again an instrument known as the Stadiometer. The principle is described iu Ganot's "Physics," and by wideuing the base line the augles become more convergent and susceptible of measurement with greater accuracy.

Manica.—*The Briefless Barrister.* The iucident in Mr. Grant Alleu's tale—development of faded signatures to a will—seems quite possible on the assumption that the vegetable juice used as an ink by the South Sea Islanders coutains an astriugent, probably tanniu, which, ou the application of nitrate of silver, strikes a black, thus showiug once more the original writing in the document. Works of fiction often draw upon the imagination to a larger extent than is here suggested ; the fact may be literally true, but without kuowing auythiug of the ki plant, we cannot say for certain.

R. E. S.—*Mounting Cards.* The ornameutation of the bridal card may be quite satisfactory if executed in pure silver, but white brouze, an alloy of tiu, is sometimes employed, which would assuredly iujure the photograph. Test the so-called silver printiug for yourself by touching it with a solutiou of silver nitrate, and you will soon see whether there is any reduction.

G. D. — *The Canadian Scheme.* Please make your own enquiries direct, for we know uothing more thau was stated in the advertisement.

L. T.—*Chromo-Lithographic Work.* The specimens are still hanging on the walls at 50, Great Russell Street, aud are well worth your inspection. The assistant-secretary attends every afternoon, and you will be welcome to see them on handiug iu your address card.

No Collodion.—*Insurance Risks.* Now that collodion is seldom or never used, the question of fire risk from this cause does not arise. Do not withhold any information you are bound to give ; but the office will know how to protect itself, and may even make an inspection of your premises.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1710.—*June* 12, 1891.




CONTENTS.



## INVENTION AS APPLIED TO NEWSPAPERS.

The new journalism is a remarkable feature of present-day enterprise, which old-fashioned people do not look upon as one of our most satisfactory American imports. But the thirst for news is so great, the hunger for the marvellous so continual, and, more than all, the competition among the myriad publications so keen, that editors have some excuse for adopting any method which proves attractive to the multitude. It is unfortunate, however, that from this new method of conducting newspapers there should have sprung a system of printing that which professes to be news, but which is too often the mere product of the reporter's imagination. In other walks of life a man who deliberately writes down a statement which is false is, to say the least of it, shunned by his fellow men; but it would seem that if he be a journalist, he is not only paid for his wrong doing, but is further encouraged to invent something still more audacious.

The rapid advance in matters scientific during the past few years has given these men a great opportunity, of which they have not failed to take full advantage. One marvellous machine has followed another so rapidly, and each one has been a reality which has so far distanced romance, that the public, unversed in technical matters, have been not only ready but positively eager to swallow anything placed before them, provided that it be of the supernatural or wonder-working kind. It was only a few months ago that one of these stories went the rounds and was believed in, for it was cleverly told, and it had both a local habitation and a name, or rather two names, given to it.

The scene was laid in an Indian village, and the *dramatis personæ* comprised two intelligent Americans—one an artist provided with pencil and sketchbook, the other an amateur photographer armed with a kodak. Another of the principal actors was a travelling fakir, who had come into the village in order to show some conjuring feats. The rest of the stage was filled in with the usual crowd. Now, the two Americans had conceived the notion that these fakirs are able to hypnotise their audiences, and so cause them to see things which do not actually exist, but which are created in the imagination of the fakir, and transferred by him to the minds of the onlookers. To test this theory, they arranged the one to sketch what he saw, or thought he saw, and the other to check him by quietly photographing the same scenes. The fakir went through his programme. He made the mango tree grow from its seed. He threw a ball of twine towards the sky, up which a boy climbed until he disappeared from sight, &c., &c. All these things were recorded in the sketch-book, but the kodak pictures showed only the fakir sitting alone. It was clear that the other images which he had conjured up were but illusions, and that the hypnotic theory was the correct one. This story was told in great detail, but it turns out to be simply an idle tale, and one invented to satisfy the public craving for the marvellous. The wonders of modern photography naturally tempted the narrators, and so the detective camera is brought into employment.

The latest of these wonderful stories, which we printed last week, also depends upon photography for its principal feature, but an examination of its details by anyone who has a knowledge of photographic apparatus will at once show that, if not positively impossible, its narrator certainly does not suppress his power of exaggeration. According to this story, which came *via* Dalziel's Agency, and appeared in most of the daily papers, Mr. Edison has invented a new machine for reproducing both sights and sounds by electricity, and the account professes to be that which the great inventor himself narrated to a press correspondent. From the description, we assume that the machine consists of a combination of phonograph and camera, and it has been christened the kinetograph.

The phonograph is now familiar to most persons, for it has appeared at bazaars and other public functions in plenty, and we have most of us had opportunities of testing its powers. That it will reproduce sounds of all kinds in the most perfect manner must be at once conceded; but anyone who has experimented with the instrument will know that the sounds themselves must first of all be thrown into the machine before a record can be made by it. And this can only be done if the source of sound—the human mouth, for instance—be placed close against the instrument while that record is being made.

The kinetograph, we are told, in which the phonographic principle plays such a leading part, is a box-like instrument which can stand on a table in front of a theatre stage, and which will record the sounds in its neighbourhood, so that they can be reproduced with all their original distinctness. If this statement be founded on fact, it is evident that the phonograph has been improved upon in a very remarkable manner, which has hitherto not been made public. But, at the same time that the phonographic part of tho new machine is recording all the sounds which it hears, the other part of the machine is receiving and recording the movements and facial expressions of the actors, and, as the two parts of the machine synchronise, every sound is illustrated by its proper movement of hand or eye.

Now, we know well enough that it is possible, under certain conditions, to photograph scenes represented upon the stage. Such pictures have been taken in plenty in this and other countries. Some of the first taken in London were photographed by an amateur worker at the Criterion Theatre, and represented scenes from the play of "David Garrick." They soon became familiar enough, for they were exhibited for many weeks in various shop windows as advertisements. If we remember rightly, the photographer had the advantage of a private performance for the production of these pictures, so that the necessary exposure of half a minute could be provided for tableau by tableau. He used a portrait lens and isochromatic plates. This may be taken as a well-known previous experience of this kind of work, and, although the exposure might be lessened by brilliant illumination with electric arc lamps, or magnesium flash-lamps, it certainly could not be brought down to the forty-six exposures per second which are said to be the number adopted in Edison's new apparatus.

But Mr. Edison, it is said—and we certainly do not give him credit for half of these wonderful assertions—aims at the reproduction of an entire opera by means of this new photo-phonographic machine, and it is evident that in the accomplishment of such a scheme the machine must go on working without intermission. Leaving the phonographic part of the business out of the question, we read that the pictures are to be taken on a band of travelling pellicle at intervals of one inch. This means that about sixty yards of film will be used up every minute, so that during one act of an opera, lasting, say, one hour, two miles of film would be utilised, each inch of which would bear a separate picture. Such an opera as Wagner's "Meistersingers," with its four hours of action, we may presume would bo rather trying to the apparatus, for it would be difficult to find storage room for the necessary eight miles of pictures. Then the reporter of this wonderful invention lightly passes over the difficulty of developing this mass of pictorial matter; nor does he concern himself with the circumstance that it would consist of a ribbon of negatives which would require to be reproduced as positives before they could be made available for projection on the screen.

Taking the scheme all in all, we fear that this enterprising reporter doth "protest too much." It may be possible in the future to make the phonograph take up and record all sounds in its reach; to construct lenses which will give sharp lines in all planes with full aperture; to make emulsions sensitive enough to respond to forty-six exposures per second in gaslight; and to make mechanism perfect enough to do the necessary work. But we have not yet arrived at these results, and there is no immediate prospect of our doing so.

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

French Photographic Society—Paramidophenol—Photographic Shutters—Carpentier's Detective Camera—Papier Iso-Vireur du Nitrate D'Urane—Photo-Micrographic Atlas—Strengthening Large Surfaces on Negatives—Orthochromatism—Photographic Union.

*Comparative Study of Paramidophenol.*—Messrs. Lumière have advanced still further the study of the new developer that they have discovered. They have compared paramidophenol with eikonogen and hydroquinone. Their very interesting notice deserves to be read in its entirety, and we shall publish it later on. We have been able to ascertain the correctness of Messrs. Lumière's assertions. This developer works, in fact, very quickly, and gives regular results, even when the same quantity of developer is used for a very considerable number of plates. The one thing left to be desired is that this product may become easily procurable in the market.

*Photographic Shutters.*—We should like to ask whether purely theoretical questions are not invading the domain of photography a little too much. M. Demarçay has published a paper crammed with curves, with algebra, and with considerations of a purely mathematical order, on the subject of shutters. The question is one of those which, like all others, has nothing to lose in being scientifically treated. It has, however, theories which agree very badly with the putting in practice of certain formulæ and certain instruments. The least friction may vary the working of a shutter, which, on the other hand, may have some variation in action consequent on the weakness of a spring, or because a brake may be worn out. M. Demarçay does not appear to us to have arrived at any practical conclusion in this matter; and it is what we should have expected. Photographic necessities in the matter of shutters vary with the apparatus. The same system is not invariably applicable to all cameras and to all objectives. This is because one must make allowance for properties which often distance the best theoretical adaptations. It matters little if the result is good all the same, and it must be recognised that the latter case is the most frequent.

*Carpentier's Detective Camera.*—Magazine detective cameras become more and more numerous. That of M. Lumière is very ingenious. It is very much the same as that of M. Carpentier. In these instruments the plates which have not received an impression replace those already exposed by the simple movement of a button. The plates having been used, accumulate underneath, and are afterwards taken out in a mass to be developed. Unfortunately, this system requires a space relatively much greater than that which is necessary for the same size of plate in those cameras provided with frames. They are now making plates of a half-millimetre in thickness, which permit the employment of very thin frames, and of the carrying of six double backs in a very small space. A bellows camera reduced to a thickness of two to three centimetres when shut, constitutes with these frames a very portable apparatus.

*Iso-Vireur Paper.*—M. Mercier has been endeavouring to do away with the toning operation by making sensitive paper which has in itself the necessary elements for obtaining an agreeable tone. Certain formulæ for a simultaneous toning and fixing have already been employed. M. Mercier introduces into the sensitising bath for the paper certain chemicals which give it a good tone by means of the fixing alone. He shows some positives thus obtained with a preparation of nitrate of silver and of nitrate of uranium; the tone of these pictures resembling that of the best toned with gold. This is what M. Mercier calls *iso-vireur* paper. There may be cases in which it would be preferable to employ this paper rather than the ordinary sensitive paper.

*Photo-Micrographic Atlas.*—M. Lande has shown the useful and curious application of photography that has been made in the hospital of La Salpetrière, in the practice of Prof. Charcot, namely, photo-micrographic reproductions of the medulla in divers pathological states. Thanks to the sections cleverly prepared and carefully photographed, lesions of the medulla characterising certain affections—for example, that of ataxia—are well indicated. In a manner, all the transformations which the different zones of the medulla undergo, according to the nature of the malady to which they are subjected, may be followed. This is a convincing proof of the immense service that photography can perform in pathological research.

*Strengthening Large Surfaces on Negatives.*—We now describe a method of strengthening large areas on negatives by means of absorption. It is well known how difficult, almost impossible, it is to strengthen large areas with a pencil on negatives, when it is necessary not to suppress, but only to weaken certain parts. On small surfaces the thing is already full of difficulties; but it is another thing altogether when it is a question of surfaces of a certain size. We believe we have found a sure and easy means of practising this mode of correction or modification of negatives; it consists of using dyes, introduced into the gelatine by absorption. This is how to proceed. Every part of the negative must be covered with bitumen varnish except those parts that are to be strengthened. They must be left free. The varnish is made of bitumen dissolved in benzine, and is of a thick consistency. All that part of the negative which it is intended to preserve in its original state is covered with this varnish, which is then allowed to dry perfectly. If there is any need for hurry, the drying may be assisted by placing in a warm place. The varnish should be laid on in a thick coat, and it is better to master the process by making several trials on waste negatives. As soon as the varnish is dry, the entire plate must be immersed in an aqueous solution of yellow aniline, red magenta, green aniline, or chrisoidine, of a previously tried tint, and of a depth sufficient to bring about the desired result. This process may be gone through several times if the first immersion has not given a sufficient degree of opaqueness. The plate must be rapidly washed in water after its bath of dye. After the gelatine is perfectly dry, all the bitumen varnish must be dissolved away by benzine, and there will remain the negative, but with its transparency strengthened in certain parts. This method may be applied to the colouring of lantern slides, by incorporating divers colours successively. For negatives or other proofs on collodion, the same process is applicable, on condition that the collodion is covered with a layer of gelatine, similar in thickness to that which covers gelatine-bromide plates. Thanks to this method, one obtains strengthened surfaces of a perfect purity, and much superior to those made by pouring coloured collodion on to the backs of the plates. The edges of the surfaces obtained by this latter process have very disagreeable aureoles, but nothing of the sort is to be feared with the process of local colouring by absorption. When only very small portions of the negatives are to be treated, they may be surrounded by bitumen varnish, leaving a centre of one centimetre, then with a large brush the dye may be placed on the circumscribed surface. As soon as the desired effect is produced, the colouring matter must be taken off, the plate washed in water, and allowed to dry. It is also possible, and sometimes advisable, to make combinations of different dyes in order to attain such tints as are not to be got by single dyes.

*Orthochromatism.*—A question of great interest has been raised in the sitting of the General Syndicate of Photography; that is, whether a patent specifying a special formula of orthochromatic preparations gives the right to monopolise all orthochromatic preparations. It seems puerile to have to discuss so simple a question, but certain facts lead to this necessity. The General Syndicate will decide, it is to be hoped, this question once for all, in such a manner that it may be certain that a patent covering a certain operation cannot constitute a hindrance to progress. This question is of importance at a time when orthochromatic plates are gradually replacing those of an ordinary kind.

*Photographic Union.*—At a meeting on the 6th of June, the committee of the Photographic Union, a benefit association for needy photographers, rendered an account of its cash resources. Although the formation of the Society dates from one year and a few months only, there is a capital of 10,000 francs. This is a very fortunate start, for such a capital is bound to increase, and the Society is thus founded on a solid basis. Unfortunately, the number of members present was insufficient to nominate a statutory committee. Some help has already been afforded to sufferers, but a sum remains available which will permit the sanctioning of liberal allowances.

---

London and Provincial Photographic Association.—(Programme for June).—On the 18th, "Collodio-Bromide Emulsion"; 20th, outing to Carshalton and Beddington; 25th, "Orthochromatic Photography."

Centenary of the Birth of Michael Faraday.—H.R.H. the Prince of Wales has fixed 4 o'clock on Wednesday, the 17th June, for the delivery by Lord Rayleigh of the first of the two lectures at the Royal Institution in connection with this centenary; and Friday evening, the 26th June, at 9 o'clock, has been appointed for the second of these lectures, which will be given by Professor Dewar.

## NOTES ON PERSPECTIVE DRAWING AND VISION.*

BY DR. P. H. EMERSON AND T. F. GOODALL.

SOME years ago we made some experiments with the object of comparing a monocular perspective drawing with the drawing of an aplanatic photographic lens. We found that under similar conditions they were alike, as was, of course, *a priori*, probable. More than a year ago one of us published a short paper with an experiment, which threw grave doubts upon the truth of perspective drawing when compared with what the eye really sees.

We now offer a series of provisional propositions, experiments, proofs, and deductions, which we venture to think are of fundamental importance to all artists, as well as to physiologists and psychologists. We are working now to still further elucidate the matter, but we decided to publish the following notes, so that specialists might perhaps help us in the matter.

Our experiments and deductions, if correct, will show that for scientific reasons the accepted rules of monocular perspective are likely to mislead the artist, and prove the fallacy of photographic and all mechanical methods of measurement.

*Proposition* A.—The eye does not constitute a symmetrical lens,† the top and bottom portions being different. That portion of the eye which perceives distance and distant objects (*i.e.*, those above the ground) sees the objects on a larger scale than the portion of the eye which views the foreground or nearer objects, therefore our impression of nature is not what we get with a mathematically correct perspective drawing, or the drawing of an aplanatic photographic lens. That is, a perspective drawing surprises us by making the foreground objects look larger in proportion to the distance. Also we see a larger arc with the lower half of the eye than with the upper.

*Proof* 1.—That we do not see the same amount with both halves of the eye (upper and lower) is proved by the observer lying on his back and looking straight up at the sky, when he will find that the field of vision of the upper half is much more limited than the space seen by the lower half of the eye. This holds for either one eye alone, or for both when used together.

The proof is completed when we stand with our legs apart, and, standing with our back to the landscape, bend down and look between our legs. Here the fields are inverted, and consequently the distance appears small and far off, and gives much more the appearance of a sharp photographic rendering of the scene. This peculiar effect has long been well known, and it has puzzled a good many observers, but hitherto no valid scientific explanation has been offered.

*Proposition* B.—We think this may be the result of the naturally selective action of the retinal nerves. It has been to our advantage in the struggle for life to see all the objects near to us and close around clearly, and to compass as wide a field as possible. It has also been to our advantage in the struggle for life for certain parts of nerves to try and draw distant objects nearer and to enlarge them, so that special functions may have developed purely by natural selection.

*Deduction* 1.—That mathematical perspective drawing gives quite a false impression of what we see when using *either one of our eyes or both.*

That such is actually the case we will now endeavour to prove, at the same time still further supporting our contention that the upper and lower portions of the eye see objects in different perspectives.

*Proof* 1.—Let the observer select a church tower or tall chimney for experiment. If the sides are parallel, the object will *appear* to his eye wider at the top than at the bottom when he stands facing it at the distance of the tower itself, and looks steadily at its centre. These experiments are best made in the diffused light of evening. The experimenter must not move his eyes up and down the tower from top to bottom, and so *measure or correct* his impressions, but he must look steadily at the centre of the tower and take his pure sensuous impressions. As most towers and chimneys do taper considerably, the result the observer gets when close to them is that they *look parallel*, or nearly so. This fact was, no doubt, felt by the architects of the Parthenon, and it has never been known why they built the columns leaning inwards, a little out of the perpendicular. That they were built out of plumb has been proved by measurement; that they *look* parallel is well known, and the reason of this we venture to find in our proposition.

*Proof* 2. A very simple proof is to look about the middle of a doorway or door; it will be felt that the door or doorway is wider at the top than the bottom. The same holds with books in a book-case.

*Proof* 3.—Cut two slips of paper: (*a*) 8 inches long by 2 inches wide; (*b*) 8 inches long by 2 inches by $1\frac{7}{8}$ inches wide, so that it tapers $\frac{1}{8}$ of an inch. If the parallel slip (*a*) be held upright 8 inches from the eye (its own length), and looked at straight in the centre—the centre of the paper being opposite to the eye—the paper will appear slightly wider at the top than at the bottom, the same proviso of not correcting the pure impression by measurement (looking up and down it) holding, as we pointed out in the case of the church tower. If the observer now takes the tapering slip (*b*) and holds it narrow end upwards, looking at it in the same way, it will *appear* parallel; if he hold it wide end upwards, it will appear much wider at the top than at the bottom. This holds equally true if the experiments are made either with one eye or both, showing that binocular vision has no effect on the impressions.

*Proof* 4.—Another interesting experiment is to place a penny upright on a table, and a halfpenny 18 inches behind it and a little to the right or left of the penny. The eye must look *over* the penny at the halfpenny, so that the penny is a foreground object and the halfpenny a distant object. If the observer now looks steadily at the halfpenny, at the same time seeing the penny, he will find the impression given is that the halfpenny looks nearly as large as the penny.

Proposition A and proofs deal mainly with what we would describe as *vertical vision*—that is, with the variations in the appearances of objects when placed one over the other, as in a vertical column, or with objects at a distance as compared with objects in the foreground.

But within the radius where binocular vision acts (calculated by Mr. T. R. Dallmeyer to be sixty yards), new and important variations occur. These properties we shall consider under the term of horizontal vision.

* When we use the term "perspective drawing," we mean a mathematical drawing of various objects in the field of vision (*i.e*., angular measurement), as received on a glass plate (ordinary perspective drawing) or upon the screen of a camera, for, under like conditions, they are, as is well known, identical.

† We have ignored for the sake of simplicity the optical law of inversion of the image on the retina; when that is considered, the terms "upper" and "lower" must be merely interchanged.

*Proposition.*—Within the limits where binocular vision is effective—say normal vision (8 inches) to 60 yards—objects *appear smaller when they are compared with objects beyond the binocular limit;* that is, they appear smaller as compared with drawings as given by monocular or mathematical perspective.

An experiment to practically bring the effect of the binocular vision variations entering into the matter may be made as follows:—Take the tapering slip of paper aforesaid (*b*), and place it between the two eyes, the wide end resting upon the bridge of the nose, the slip being inclined at an angle of 30° with the horizon. The result is that the paper vanishes *towards* the eyes—diametrically an opposite result to what perspective would lead us to expect. This phenomenon still holds if the paper be gradually moved away from the eyes, and held at arm's length, but in the same plane.

*Proof.*—Place a book at a distance of six feet from the eyes. Then proceed to measure the width of the book with a pencil (one eye being closed), as a draughtsman draws objects by monocular perspective, and then open the other eye, and measure the width of the book with both eyes; the binocular measurement will be found to be smaller than the monocular measurement. If the height of the book be measured in the same way, there will be no difference in the result obtained with one or both eyes.

But more convincing is Proof 2. Wafer a square sheet of white paper (say eight inches square) on the wall, or on a window, six feet from the observer, and look at it. The impression given will be that it is larger vertically than it is horizontally. This explains the old trick of marking off the height of a tall hat against a wall; as a rule, everybody places the mark too high—the reason is now explained.

Still another proof. Stand a halfpenny and penny on the table, as directed in the previous experiment. Now place the eyes on the same level as the plane of the table and observe. The result will be exactly the reverse to that previously obtained. That is, when looking directly at the halfpenny, at the same time looking (indirectly) at the penny, the penny will appear the larger, and *vice versa*, when looking directly at the penny and indirectly at the halfpenny, the halfpenny will appear nearly as large as the penny.

Another every-day proof. Let a person sit in one end of a long punt with parallel sides, and look at the other end; it will look to him to be wider than where he is, and yet its sides will by perspective laws vanish quickly away from him.

These proofs show the effect of binocular vision, which is to increase the appearance of height and to narrow the appearance of breadth; consequently, it makes objects appear taller than a perspective drawing would do.

*Deduction.*—The reason we get a different impression of relative sizes of objects by normal vision from that given by mathematical perspective drawings and photographs is, that the combination of these properties of vertical and horizontal visions give quite a different result to that of perspective drawings.

*Final.* Having shown how we see forms, it only remains to say that a mathematical perspective drawing, or the drawing of an aplanatic photographic lens, does not give forms as we see them. They are altogether false to the visual impression of the proportions of things, and therefore give a wrong idea of the original scene. On the other hand, a perspective drawing or correct photograph gives the *actual facts* scientifically, *i.e.*, the pillars of the temple as leaning, the paper in experiment as *square*. All such drawings are, therefore, purely scientific diagrams, and artists who wish to render what they see must not rely upon them.

## PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

*Bath, July 6th to 11th*, 1891.—Exhibition of Apparatus, etc., to be held in the Guildhall, Bath.

The following circular has just been issued :—

Dear Sir,—At the above meeting an exhibition of apparatus will be held as usual, and we beg to call your attention to it, and to ask your co-operation. Our desire is to have on show all apparatus of any novelty, and it is proposed to make special features of such articles as the following :—Hand-cameras; apparatus for taking photographs in rapid succession; photomicrographic apparatus; balloon and military photography; flash-light apparatus; apparatus designed for special work—as medical, underground, &c.; optical lanterns and fittings; photometrical apparatus and the like; apparatus for, and specimens of, astronomical and meteorological photography.

In order that proper arrangements may be made for the exhibition of your exhibits, we shall be glad to have from you, at an early date, a list of the articles you propose to show. There is no charge to members for space (membership tickets five shillings), but to non-members the charge is ten shillings.

Whilst the greatest care will be taken of the exhibits, the Executive takes no risk in the matter of loss or damage. Expenses of carriage to be borne by exhibitors. The Committee reserves the right to decline any offered exhibit.

Exhibits to arrive at the Guildhall, Bath, not later than July 4th, addressed to the Convention.

G. Davison, Andrew Pringle, } *Exhibition*
Friese Greene, Henry Sturmey, } *Sub-Committee.*

Glazed Surface on Prints. — The following method is recommended for obtaining a glacé finish on albumen prints without the aid of gelatine. A glass plate is coated with a mixture of ox-gall and alcohol in equal parts, which has first been allowed to stand for several days with repeated shakings, and finally filtered. The washed albumen print is then placed in contact and squeegeed down, and, after drying for about an hour, will come off with a beautiful glazed surface. If the print is to be mounted and the gloss retained, it should be covered as soon as transferred to the glass with a sheet of parchment paper somewhat larger than the print, previously coated with starch paste, and then treated on the back with a good coat of gum or dextrine. It may then, when dry and removed from the glass, be placed in contact with a moistened cardboard and subjected to pressure.—*Anthony's Bulletin.*

Messrs. Taylor, Taylor, and Hobson send a tastefully got up and well illustrated catalogue of photographic lenses and sundries, with a very useful appendix on "The Principles of a Lens' Action." Their adoption of the standard flange screw fittings of the Photographic Society of Great Britain has led Messrs. Taylor, Taylor, and Hobson to adopt a system of providing that all lenses fitting the same flange should screw home with their diaphragm indexes or other fittings in the same convenient position—a system that has now been included in the Society standards. A series of standard screw adapters serve to carry any lens in a flange larger than its own, and to carry it in the standard uniform convenient position. Lens hoods are also standardised. They have included a series of lenses for stereoscopic work, and a series of caskets of lenses which are novel in the manner of grouping different types of lenses in one portable casket. The use of the "C" finder in connection with the table given, for determining the angle of view of lens to be employed on a subject, is thought by the firm to be a new suggestion. The book is supplied in paper covers free to all who apply for it.

## PHOTOGRAPHIC METHODS OF OBTAINING POLYCHROMATIC IMPRESSIONS.*

BY LEON VIDAL.

*Composite Photochromy.*—We borrow this name from Mr. Ives, of Philadelphia, although he gives it a more theoretical meaning.

In this method the various colours are not interpreted by the eye, but are combined by allowing photography to carry out the required selection automatically, and preparing, by means of special negatives, the various monochromes, which, when superimposed, reproduce the colours of the original. This method is somewhat complicated, and the photographic part of the work presents serious difficulties, because of the infinite variety of tones and tints, and the almost theoretical precision with which it is necessary to work in order to arrive at satisfactory results.

There are two distinct series of operations:—First, the preparation of the negatives; and secondly, the printing of the monochromes by whatever method is chosen. Typography, lithography, and collotype are the most suitable. Woodburytype may, in this case, also be reserved for the final printing on the proof required to give metallic effects.

Many different suggestions have been made with regard to colour selection by photography. The principal writers who have considered the question are Henry Collen, Cros, Ducos-du-Hauron, Poirée, Abney, Vogel, Stolze, and lastly, Ives, who, at the present time, is publishing important and remarkable works on this question. From all these researches, carried out by eminent investigators, we must endeavour to deduce some practical or commercial conclusions.

It is more important in this method than in simple photochromy to orthochromatise the plates, because it is necessary, in the case of the refractory colours, not merely to obtain the corresponding values, but even to exaggerate their actinic effect. The red, for example, ought not merely to act upon the plate so as to produce a tint corresponding to its luminous effect; it should produce the same effect as white. Thus, a red flower ought, in the *cliché* corresponding to the blue monochrome, to have the appearance of a white flower.

Up to the present time, having read, and tried experimentally, all that has been published on this subject, we have come to the conclusion that colour selection, by means of three negatives, each intended to eliminate two of the primary colours, does not give an absolutely accurate result. Taking each colour in turn, we wish first to eliminate all colours other than yellow; or, in other words, to obtain a negative which will produce the yellow monochrome. Even admitting that the three primary colours (yellow, blue, and red) are sufficient to reproduce, by their combination, all possible colours and shades (and of this we are very doubtful), it would be necessary to eliminate successively all the colours of the subject which are not yellow, and which are not blue, and which are not red; and this is a thing which cannot be done completely.

As regards the negative belonging to the yellow monochrome, it is clear that it ought to reproduce equally all the red and all the blue, and to leave the yellow, and combinations of the yellow with other colours, represented by clear glass. A method of arriving approximately at this result is to make use of an ordinary gelatino-bromide plate. The action of the blue is, of course, extremely energetic in comparison with that of the yellow. The difference in effect thus utilised will give the yellow monochrome, but with the result of reproducing yellow wherever the original subject contains red. The employment of carmine instead of vermilion, when printing the colours, will permit the yellow to be utilised for obtaining vermilion by its combination with carmine. Thus we obtain one negative which is fairly exact, although it does not completely separate two colours from the third.

We will now consider the negative corresponding to the blue monochrome. This one should separate out the red and the yellow—that is to say, it ought to receive from the blue colour, which is so powerful, hardly any impression, while the yellow and the red, which are so little actinic, ought to give the effect of white. The method of obtaining this result is to employ an orthochromatic plate, which is sensitive to green, red, and yellow, exposed behind a reddish-orange medium. The blue is, to a large extent, cut off, while the yellow and red rays pass through. The length of exposure is naturally considerably increased, but a few minutes' additional exposure are of little importance when photographing inanimate objects. For all practical purposes the negative gives fairly accurate results.

The third negative, corresponding to the red, seems a simple one to prepare by means of an orthochromatic plate, sensitive to yellow, and used without a screen. Evidently it is not necessary to restrain the reds, which produce but a very moderate effect. The blue and yellow will produce a powerful effect, and the required colour selection will take place automatically.

If from each of these three negatives we prepare a collotype print in its corresponding colour, and superimpose these three monochromes, we shall see, in most cases, that we are far from the desired result. Theoretical accuracy is far from being attained, the number of monochromes is insufficient. To produce results of commercial value, we must use at least four *clichés*.

The fourth *cliché* should be obtained with an orthochromatic plate sensitive to green, yellow, and red, using a yellow orange screen to moderate the blue and the violet. This *cliché* gives a body to the work, which would be incomplete with the red, yellow, and blue printings only.

One ought, moreover, after carefully studying the original, to retouch each negative, and remove the imperfections which will inevitably appear, whatever be the process employed. This retouching can be rapidly done; it diminishes in no way the artistic effect or the accuracy of outline, and it enables more exact colour effects to be obtained.

The printer in colours, having the above-mentioned four monochromes, sees at once what their defects may be, and a preliminary trial shows him immediately which portions require to be toned down. The bulk of the work is ready, and it need only be retouched here and there, an operation involving but little labour.

In order to employ phototypography for this kind of polychromatic reproduction, it is necessary to convert the negatives obtained directly into stippled negatives suitable for typography. This is done by making a positive reproduction through a grained screen. The trials can then be made by means of collotype, and afterwards, when the new negatives have been corrected by hand so as to give the proper effects, the typographic *clichés* are prepared.

For this process it is advisable not to use the same screen in every case. The various monochromes should

* Concluded from page 420.

be divided up by different series of points or lines, the resulting picture being better than if the same series is used throughout.

Even in the case of composite photochromy, it may be necessary to print flat tints. The printer must judge what is required, and must not for a moment think that three negatives, three colours, and three printings are sufficient to produce every effect.

Theory itself we need not consider, but practice indicates clearly that, to make good use of scientific data, it is at any rate necessary to know how to combine them with facts which have, through commercial means, been well established.

This second method of composite photochromy is capable of unlimited variations which cannot be enumerated in a short paper. We must remember this, that, by means of colour selection, with the aid of four different *clichés*, one obtains a result which leaves little to be done by hand, and gives excellent polychromatic copies. If a larger number of negatives be necessary, one can prepare two or three more, limiting more closely the colours which are allowed to act on each, but it will rarely be useful to prepare more than four negatives.

In the method described above for colour selective effects, we think it advisable that the worker should follow closely the suggestions here given. This method, although very ingenious from a purely theoretical point of view, falls far short of perfection if retouching be not resorted to, but we repeat once more that this additional labour is nothing compared to the work executed in the photographic part of the process.

Let us not be too dogmatic. Let us at present acknowledge our incapability of reproducing colours directly, and let us combine the advantages which indirect methods afford with those of judicious interpretation and retouching. Photography is already far advanced, but cannot yet be trusted to give immediately the monochromes required to produce by their combinations a polychromatic impression exactly similar to the original.

If we grasp thoroughly the points which are necessarily but briefly described above, all lithographers and typographers can obtain excellent results in copying from nature, or from works of art. Practice will, of course, increase the manipulative skill, and permit the result to be more easily obtained. It appears, then, strange that there are still so few photographic studios devoted to these kinds of printing. How is it that collotype, which is so simple and so easy a process, and which would be of such great assistance to the lithographer, is still only worked by a few specialists? While, on the contrary, no lithographer ought to be able to dispense with it. We should be glad to make lithographers appreciate that it would be of the greatest help to them in all kinds of photochromy.

That is the object of this paper, and we hope that the fact of its being read before the Photographic Society of Great Britain will cause photography to be more generally applied for the production of polychromatic impressions. Space has not permitted the insertion of technical details, but we are convinced that through the great advances which have been made in orthochromatic photography, and with the aid of the remarkable results which have been published on this subject by many investigators, especially in England, it would be easy for anyone who wishes to practise photochromy to do so successfully, by adopting, according to circumstances, one or other of the methods above described.

## A NEW LANTERN EFFECT.

The late Mr. Woodbury devised a number of very pretty lantern effects, which were brought about by the use of a glass tank placed on the lantern stage. Such a tank can easily be made by fixing in a frame two pieces of good, clear glass, and forcing between them a bent piece of india-rubber tubing, which at once forms a water-tight joint. In such a tank as this, and with the help of a few pipettes, coloured fluids could be urged into the water, with the result that on the screen arborescent and moving forms of very curious and beautiful appearance were projected. Many of these experiments depended for their effect upon chemical union between the liquid injected and that in the tank. Other fluids employed were simply diluted aniline dyes.

Mr. H. C. Ogden, of Middletown, N.Y., has adapted this principle to the production of a lantern slide giving the effect of a volcano in eruption. This effect cannot usually be produced except by a double—or, better still, by a triple—instrument, for one lantern stage is occupied with the general view of the mountain, another by the necessary lightning, and the third by the rackwork-wheel arrangement which causes the smoke and fire from the mountain to be vomited out in a circular direction, and in a manner as unlike nature as possible. By Mr. Ogden's method, the whole business can be brought about by one slide; but the effect would doubtless be heightened if another one depicting a general view of the mountain were associated with it. The new arrangement is thus described in a recent number of the *Scientific American*:—

"Not everyone can go to Europe, but, possessed of a lively imagination, one may go there in spirit, provided only that the scenes are presented pictorially in a truthful and artistic way. Thanks first to the skill of the optician, and secondly to the modern photographic art, anyone may be instructed and entertained by the modern lanternist, who will produce storm or sunshine, winter or summer, or the soft effects of moonlight at will upon the screen by the skilful manipulation of the optical lantern with a truly wonderful effect; but there are many effects which seem to be difficult of execution by means of the optical lantern. The saying is, 'See Naples and then die'; but what is seeing Naples without seeing Vesuvius in active eruption? Comparatively few European travellers have the good fortune to witness this phenomenon, and until now, so far as we are aware, no one has been able to faithfully represent this awe-inspiring spectacle.

"Mr. H. C. Ogden, of Middletown, N.Y., has come to the aid of the lanternist and the non-traveller, by producing a very simple apparatus by means of which Vesuvius, in full eruption, may be projected on the screen in a very vivid and realistic manner.

"In a glass tank attached to the lantern are inserted two curved drop tubes, with their extremities placed side by side, and on the rear of the tank is painted a picture of the volcano, which is represented mainly in profile by black varnish applied to the glass. The tips of the drop tubes coincide with the crater of the volcano, and from the crater down the sides there are transparent streaks representing lava. To the side of one of the clamps holding the tank together is attached a spring carrying a strip of metal, which extends along behind the opaque portion of the picture, and is provided with teeth which are designed to irregularly eclipse the transparent streaks. In one of the drop tubes is placed a dark liquid, such as diluted ink, and in the other is placed a bright red liquid, as red aniline ink. The tank is filled with a solution of glycerine and water, and inserted in the lantern. Dexterous manipulation of the flexible bulbs of the drop tubes produces red and dark streaks representing fire and heavy smoke, which are forced down in the tank and have the effect of rising in the image on the screen. At the same time, the manipulation of the spring at the side of the tank alternately displays and covers the streaks representing the lava."

## Notes.

The death of M. Alexandre Edmond Becquerel, at the ripe age of 71, removes from the scientific world a notable man of genius. M. Becquerel was a member of the Academy of Sciences, of the Institute of France, Professor at the Museum of Natural History at Paris, and the Conservatoire des Arts-et-Metiers. In our Year-Book for 1890 we published a portrait of the eminent Frenchman, and devoted several pages to a description of his work in connection with the production of photographs in natural colours, of which branch of research he was certainly the chief exponent. To this description of Becquerel's experimental work we refer all those who are interested. But beyond these useful researches Becquerel contributed much to scientific knowledge, and his original experiments with the phosphoroscope—an instrument invented by himself to show how many substances exhibit the phenomenon of phosphorescence after insolation—would alone prove his title to honourable distinction. M. Becquerel has gone to his rest, but he leaves behind him a name which will not quickly die.

Most persons have been under the pleasing impression that, whatever might be the faults and failings of the country called Great Britain, it at all events was properly mapped. They had a further impression that for a certain sum it was possible to buy a map, in sections, which, founded on the Ordnance survey, was as accurate as such a thing was possible to be. These notions, they are now informed, are founded on a misapprehension altogether, and the mapping of the country seems to be in a very incomplete state.

Upon the vote to complete the sum of £215,770 for the office of the Ordnance survey the other day, an energetic M.P. called attention to the very unsatisfactory rate at which the Ordnance survey was proceeding. It seems that this survey comprises three distinct publications, viz.: a twenty-five inch to the mile map, a six inch to the mile map, and a one inch to the mile map. The survey for the first of these—which is little more than half done—was commenced thirty years ago! The second map is in a more forward state, but it was commenced in 1842, and must therefore comprise much ancient history; and the one inch map dates from the beginning of the century! Well might the indignant M.P. exclaim "that a map forty years old was for many practical purposes quite useless."

Mr. Chaplin's reply showed that the new Minister for Agriculture, under whose department this business comes, does not know very much about map-making, and, at the close of his speech, when he referred to the help that photographic process work could afford, he evidently had very little practical acquaintance with what he was talking about. To speak of "zincography" as a new invention was certainly funny. "The work produced by that invention appeared to him," he said, "to be excellent." And he was informed that the maps, by its aid, "might be completed by the year 1900." We wonder how long these ordnance maps would have lingered on in the absence of this "new invention!"

An enterprising City photographer exhibits a very suggestive show-case, in which, with the assistance of specimens, he points out the varied uses to which photography can be applied. Some of these specimens are decidedly novel. One represents the interior of a drawing-room; very useful in case you want to let your house furnished. A second photograph shows a wall thrown down by the effects of an explosion, and in the event of disputed damages would convince any jury that there was no mistake as to the shattered condition of the wall in question. A third represents the ruins of a fire, and is obviously a hint to the insurance offices. A fourth is entitled "Ancient Lights," and speaks for itself; while a fifth, which is called "A Right of Way," shows how "village Hampdens," whose rights are encroached upon by rapacious lords of the manor, may enlist public sympathy. It is only fair to say that the manipulation of these photographs is very good.

There is a fine opportunity just now at the Paris Hippodrome for the photographer to show his skill in instantaneous work. Hitherto lions and lionesses have been photographed chiefly in a state of repose. Enclosed as they usually are in cages, the circumscribed space and the feeble light in many cases imposed conditions on the photographer which have somewhat fettered him. The managers of the Hippodrome, by the invention of an ingeniously contrived lift, now are able to convey the animals from the cages to a suitable arena, where they can have such gambols as the increased area may tempt them to indulge in. A lion and lioness leaping at some meat which is placed beyond their reach have been photographed by MM. Londe and Yvart, and these photographs are reproduced in *La Nature*. Our contemporary says that the movements of the animals are not at all like what we have been accustomed to see in menageries.

One would like to have Lord Coleridge's opinion on the various likenesses of himself which have appeared in the illustrated and evening papers during the last few days. The Lord Chief Justice used to be rather sensitive on the matter of his portraits—so much so, that for a long time past it has been impossible to get a photograph of his lordship. The story goes that, on one occasion, he entered the shop of a well-known dealer in photographs not a mile from the Law Courts, and, buying up all his portraits, then and there destroyed them. Perhaps, however, he may be now hardened, as it was stated a few days ago that a Devonshire photographer had overcome his objection to sit. If he will also permit his photographs to be sold he will receive the gratitude of journalistic artists, for the face of the Lord Chief Justice is most difficult to draw.

Photographs on the retina run the discovery of photographs in natural colours very hard indeed when the gossipy paragraphist is hard up for material. A paper which certainly ought to know better says that, in the photographic exhibition now being held at St. Petersburgh, one of the most remarkable exhibits is, without doubt, an enlarged photograph of the retina of the eye of a young lady who was murdered several years ago at Samara by a soldier. The likeness of the murderer was found so clearly imprinted on the retina of his victim that it was possible to discover the criminal, and bring him to justice. The falsity of this and similar stories has been demonstrated over and over again. All that is known on the subject was well told some years ago by Mr. W. S. Bird, and nothing has happened since to weaken the conclusion that such photographs had never existed.

## WHY IT IS NECESSARY TO ROCK THE DISH DURING DEVELOPMENT.

BY PROFESSOR W. K. BURTON.

When gelatino-bromide dry plates were first introduced commercially in England, and when there were but few rival makers—either two or three—one of these declared that there was no necessity to rock the dish during development, and that, indeed, it was the reverse of advantageous to do so. Experience soon showed that this statement was wrong, and it has ever since been customary to keep the developer in motion over the sensitive film. The reason why this is necessary has been explained more than once, but the whole of the explanation has seldom been given.

At the time I refer to—about ten years ago—I satisfied myself that it was not only an advantage to keep the developer in motion over the plate, but that it was a *very great* advantage. This was shown by exposing a plate, cutting it in two, and developing each half with half of the same lot of developing solution, keeping the dish containing one half of the plate in motion, and leaving the other at rest. The former developed more quickly than the other, and moreover, even after a much longer development, the latter still appeared thin and flat as compared with the former.

What seemed to me to be the solution of the phenomenon at that time was simply that a developer in motion naturally acted more vigorously than one at rest, because a fresh quantity of developer was continually being brought into contact with each portion of the film. This is, doubtless, a part of the reason, but there is a deal more reason than this.

To follow fully the reason why the use of a developer allowed to remain at rest results in a thin, flat, and sometimes even foggy image, we must imagine two parts of the film, one that has received no light, the other that has received that amount of light that should make it one of the densest parts of a negative. I suppose the developer to be alkaline pyro. The action on that part of the film that has received no light is simply *nil*, if the plate be of such a kind that it does not fog under the developer without the action of light.

Let us follow, however, the action of the developer on the part of the plate that has been acted on by light. We know that it will begin to darken, the bromide of silver of the film being reduced to metallic silver. The action that is supposed to take place is as follows. The alkaline pyro has a strong affinity for oxygen—for that of the water constituting the solution, as well as for any other oxygen. It will not, however, decompose the water, unless there is present some body eager to take up the hydrogen, of which, in water, there are two atoms for every one of oxygen. This is at hand in the bromine of bromide of silver that has been acted on by light. The hydrogen and bromine combine, forming hydrobromic acid ($HBr$). This hydrobromic acid, however, immediately combines with some of the alkali to form a soluble bromide—bromide of ammonium, bromide of sodium, or bromide of potassium, according to the alkali that has been used—and this soluble bromide is a strong restrainer.

Now see what state of affairs we have. On the part of the negative that has not been acted on by light we have still the normal developer acting, whilst on the part that has been affected by light we have a developer that has been modified in the following way. The quantity of pyro has been reduced, the quantity of alkali has been reduced, and a restrainer has been added. Moreover, over the whole surface of the negative we have a developer acting that is reduced in strength in pyro and alkali, whilst it is restrained with bromide just in proportion to the amount of light that has acted on any part of it. In these circumstances we need not expect a strong or brilliant negative. Such is only to be had if we wash out the restrainer from the parts that have been most acted on by light, whilst we add fresh pyro and alkali, and this is only to be done by keeping the developer in motion. Indeed, a more vigorous way of doing this is to continually pour the developer on and off the plate, and this will be found a good way to develop negatives when there is difficulty in otherwise getting vigorous results.

In the case of plates—and this is the case with most—which veil more or less even without the action of light, this veil will be greater in the case of development without rocking than when the developer in kept in motion, and this for obvious reasons. Of course, the result is a still further degradation of the negative developed without motion of the dish.

A phenomenon that is often seen in the case of plates that veil somewhat under the developer, even without the action of light, whether this veiling is due to the plate or to the use of too strong a developer, depends on this fact, that immediately darkening begins at any part of the film, the developer absorbed by that part of the film is both weakened and restrained, and this to a certain extent even if the dish *is* rocked. The phenomenon that I refer to is the appearance of a *positive* image on the back of the plate. From what I have already said, I think the cause of this will be evident. Whenever this positive image appears, it shows that development has been carried about as far as there is any good of carrying it.—*Wilson's Photographic Magazine.*

## PROPERTIES OF ALUMINIUM.

The gradual introduction of this metal as a substitute for brass in photographic apparatus is causing a great deal of attention to be concentrated both upon its manner of production and its properties. At a recent meeting of the American Institute of Electrical Engineers, the subject of aluminium once more came to the front. Professor Crocker stated that in his opinion it is a very common mistake to attribute to aluminium itself the tensile strength of aluminium bronze, which exceeds that of wrought iron, and is about as high as good specimens of steel. It is really one of the most tenacious metals known, but its composition is about nine parts of copper to one part of aluminium; yet its tensile strength is almost invariably attributed to pure aluminium, having a specific gravity of 2·6, which is only one-third that of iron. They take the low specific gravity of pure aluminium and the high tensile strength of aluminium bronze. As a matter of fact, the specific gravity of aluminium bronze is higher than that of iron. Therefore, we do not have lightness combined with high tensile strength. Turning again to aluminium itself, its tensile strength is about 26,000 pounds per square inch; in other words, about one-third that of iron. This just balances the difference in specific gravity, but still leaves the advantage in favour of iron, because one-third of the volume has the same strength and the same weight as a rod of aluminium. Now, the same exaggeration is applied to its other qualifications; for example, its chemical properties. Aluminium bronze is remarkably free from tarnishing. A bright surface of aluminium bronze may be exposed to the atmosphere for several months and retain its polish. That property is attributed to aluminium itself. Aluminium, as Mr. Brown said, is not particularly liable to corrosion, but if it is subjected to salt water or alkaline water, or even ordinary moist air, it does tarnish and oxidise rapidly. Salt water is quite hurtful to it. Therefore, freedom from oxidation is another property that is wrongly attributed to it; and the objection to all this is that it gives a very wrong impression in regard to what would otherwise be a good and legitimate object of admiration. In regard to its real properties, he thought the pure metal entirely too soft for structural purposes, as it can easily be cut with a knife; as to its chemical properties, it oxidises with about the same ease as zinc, tin, and iron. Is eagerly attacked by acids. It is not much affected by sulphur or sulphuretted hydrogen, which is a great advantage. It is very freely dissolved by alkalies, whereas most other common metals are not. In an ordinary alkaline solution, aluminium is dissolved, as most metals are, in acids, with the evolution of hydrogen. This is quite a serious disadvantage for a common metal, which is liable, for example, to have soap used upon it. We do not expect metals to be attacked by alkalies.

Its conductivity is about twice that of copper, weight for weight. The increase of size to get this conductivity, however, would preclude its use in place of copper in rubber insulated wires on account of the increased expense of insulation. The electrical process would undoubtedly monopolise its manufacture, because it offered the only successful way of reducing it; the only competing chemical process being by use of sodium, which is in reality electrical, because the sodium is made electrically.

Society of Arts Conversazione.—The Society's *conversazione* is fixed to take place at the South Kensington Museum (by permission of the Lords of the Committee of Council on Education) on Wednesday, 17th June. The reception by the attorney-general (Sir Richard Webster, M.P.), chairman, and the members of the council of the Society will be held from 9 to 10 p.m. Promenade concerts will be given by the band of the Grenadier Guards, and also a concert of Old English music.

Report of Harvard College Observatory.—Prof. Pickering has just issued his report for last year. He again urges the necessity of a fireproof building for storing the 27,000 photographic plates of spectra, 9,000 of which were taken in 1890. . . . During the past year 1,309 photographs of stellar spectra have been taken with the Bache telescope at the station near Closica, in Peru. Nearly all of them relate to the region south of $-20°$. Mrs. Draper has added another instrument of the same kind to the Henry Draper Memorial. This is mounted in the Observatory grounds at Cambridge, and since Septemper 1889, 2,157 photographs have been taken with it, covering the sky north of $-20°$. By placing a prism of small angle over the objective, the spectra of stars as faint as the tenth magnitude have been obtained. Six stars with Type IV. spectra have been discovered. Spectra of fifteen planetary nebulæ have been photographed. The hydrogen line F has been shown to be bright in eight stars. Bright line stars of the Wolf-Rayet type now number twenty-eight, three having been added to the list during the past year. The names are given of thirty variable stars of long period, in which the hydrogen lines are bright at maximum. This peculiarity has furnished a means of discovering seven new variable stars. . . . . An important accession to the white spot surrounding the southern pole was found by photographs to have occurred between the nights of April 9th and 10th.—*Nature.*

## THE KINESIGRAPH.

In view of the great interest which has recently been aroused in the various plans put forward for photographing animal and other movements, we call attention to an instrument, the "Kinesigraph," which was patented so long ago as August, 1889, by Messrs. W. Donisthorpe and W. C. Crofts. The following is an extract from the Specification, No. 12,921. This document is illustrated with elaborate drawings, and those who are interested in this field of photography should not fail to study it, in order to see how much ground it covers, and possibly to prevent them re-inventing anything comprised within it. We have been informed that already series of photographs of moving objects have been taken with the instrument at a rate of from eight to twelve per second. A portion of the machine is now being slightly modified in order to ensure greater uniformity in the travelling of the band of pictures through the lantern. The experiments show that, owing to the comparatively long time during which each successive picture can be kept absolutely stationary before the spectator's eye, and which constitutes a distinctive feature of the mechanism, a maximum speed of twelve per second need not be exceeded in order to secure the effect of continuous and natural motion.

This invention has for its object improvements in the production and representation of instantaneous photographic pictures.

The pictures are produced upon a sensitive film or surface carried by a long roll of paper or other material. The roll is continuously unwound from one drum and wound upon another, and in its passage a series of images are successively thrown upon it by a photographic lens. A screen is provided between the lens and the exposed sensitive surface. This screen travels out of the way to permit the image to fall on the sensitive surface, and covers the lens again as soon as the exposure is complete. These operations take place with regularity and, usually, great rapidity, so that several pictures are taken in each second during the time that the apparatus remains at work, which will be for many successive seconds, indeed for any length of time which may be desired. The scene selected for photographic presentation will be one of constant movement—for example, a street scene—so that each picture will differ slightly from the preceding and succeeding pictures.

The camera may be arranged in the following manner:—In the fore part is the lens, and immediately behind the lens the screen which regulates the instantaneous exposures. This screen may be an endless band passing around pulleys and travelling at high velocity. In the band there are two perforations or apertures, and twice in each rotation of the band these perforations coincide, and the light is then able to pass from the lens through the perforations on to the sensitive surface. The lens forms the scene upon the sensitive surface. The focus is accurately adjusted before commencing the operation by the aid of a slide on which there is a focussing glass and guide rollers over which the continuous sensitive paper or material passes.

The screen and the winding apparatus are so geared together that the sensitive surface travels the distance necessary to separate the pictures between one exposure and another. In place of the travelling perforated belt a disc perforated with a narrow slit and driven by bevel-wheels may serve the purpose. After the pictures have been taken, the roll is removed from the camera, and the pictures upon it are developed in the ordinary manner. From this continuous band of negative pictures a similar band of positive pictures is produced, and rendered transparent by the application of vaseline, or vaseline oil, or by any other suitable process.

For the exhibition of the pictures a lanthorn similar to the ordinary magic lantern (or if a non-transparent positive band is used, then a lanthorn similar to the opaque magic lanthorn) is employed, in which a brilliant intermittent electric light is provided. The lanthorn is provided with condensing and focussing lenses, by the aid of which the light, after having passed through the transparent positive picture, is focussed upon a screen. Each picture is thus exhibited only by one flash of the intermittent light, for the band of pictures travels on and, by the time the next flash occurs, another picture is in place. Thus, several pictures are exhibited upon the screen in each second of time throughout the whole period of exhibition, which will usually be approximately the same as that occupied in taking the pictures. The change from picture to picture and the flashing of the light is so rapid—about seven flashes per second—as not to be discerned by the eye, and the appearance on the screen is that of a picture in which the animate and other objects exhibited are in movement. In order that the flash may synchronise accurately with the picture in position, contact pieces are provided upon the travelling band, and by the passage of these the flashes are determined. Or a continuous light, electric or other, may be used, and the recurring flashes obtained by a perforated screen travelling at high velocity as in the camera above described, the coincidence of the flashes with the centre of each successive picture being insured by increasing or diminishing the speed of the travelling band of pictures by an arrangement for the insertion or withdrawal of a tapering driving drum or other appropriate means. Speaking in general terms, we effect our object in the following manner. We have a photographic lens fitted to a suitable camera, exposed and shut at intervals (usually at equal intervals recurring from eight to six times in a second), throwing a succession of instantaneous images of moving objects upon a continuous band of sensitive paper unceasingly travelling behind the lens, but, while so unceasingly travelling, the band, by a compensating motion, is rendered stationary relatively to the lens during each successive instantaneous exposure, so that each image is imprinted thereon next to and touching the preceding image, without overlapping it; and from such continuous band of negative pictures duly developed a series of positive pictures, touching but not overlapping one another, are printed upon a continuous band of thin or transparent paper, and this positive band is then made to travel unceasingly behind the lens of a lantern, but, while so unceasingly travelling, the band, by a compensating motion, is rendered stationary relatively to the lens, during each successive exposure, recurring not less than eight to six times in each second, so that at each exposure of the lens, the interval between two exposures being not longer than $\frac{1}{16}$ to $\frac{1}{12}$ of a second, the centre of each picture is opposite the centre of the lens, and the image of each picture thus exposed is thrown by the lens in a magnified form upon a screen or other suitable surface.

In this way we cause the spectator's eye to receive therefrom the impression of each picture just as the impression of the preceding picture is fading from the retina, which retains it until replaced in its turn by the impression of the succeeding picture, and so on. Thus, the blank intervals between the successive exposures of the pictures are not appreciated by the eye, and the general impression produced is that of continuous motion corresponding to the successive positions of the moving objects in the series of positive pictures.

---

Photographic Club.—Subject for June 17th, "Photographing Animals"; 24th, "Actinometers," and a series of lantern slides of Hildersham by Mr. Frank Haes. Saturday outing, June 13th, Whetstone; trains from Moorgate Street to Oakleigh Park at 2.6, from Finsbury Park at 2.25.

Robbery from a Photographic Studio.—The photographic studio at 20, Lower Bridgman Street, lately kept by Messrs. A. and G. Taylor, was broken into between Monday night and Tuesday morning, and some valuable property stolen. The framework of the scullery window had been broken, and the back door was left open, this being the condition in which they were found on Tuesday morning. From the operating room two lenses valued at £20 were taken out of the machine in which they were fixed, whilst from an adjoining room a number of glass copies and the sum of £4 15s. were missed, a desk having been forced open. The police are on the look-out for the marauders.—*Bolton Evening News.*

## THE BRITISH ASTRONOMICAL ASSOCIATION.

At the seventh ordinary meeting of the Association, held on May 27th in the Hall of Barnard's Inn, Dr. W. Huggins, F.R.S., vice-president, in the chair, Mr. Cottam read reports from the Coloured Star and Saturn sections.

The Chairman said that Dr. Gill was present, and had kindly consented to give an account of the recent meeting of the International Astrophotographic Congress at Paris, and of his visit to some of the Continental observatories.

Dr. Gill said he was not able to give them a formal address, but if they would be content with a conversational account, he would be happy to tell them what he could. The purpose of the recent conference at Paris was to bring to a definite conclusion the work of the previous conferences. He would call attention to the name of the committee. It was called the Astrophotographic Committee, and advisedly so; not merely the committee for the Carte de Ciel; for the real work which they were undertaking was not merely to take a number of pretty pictures of the heavens—that might be done by photographers who were not astronomers—but to provide for determining the co-ordinates of the stars shown on the plates. The first point of importance settled at the recent meeting was the adoption of the *réseau*; the next—which was, indeed, the chief point of discussion—was the question of how to define the plates for the catalogue. It had been previously decided to have two exposures of the same field on the same plate—one to show 11th mag. stars, and the other exposure of one quarter the duration of the first; but no reason had been assigned for this decision. The object was, of course, the discrimination of dust marks from the true images of stars; but this arrangement really failed to secure it, for the shorter exposure would not show 11th mag. stars, but only stars of the 9th or 10th mag. The faintest stars—those about which it was easiest to make a mistake—would be shown only once. It had now been decided, however, that the one exposure should be sufficient to give a good, measurable image of an 11th mag. star, and the other should be half as long, yet sufficient to show an 11th mag. star as a faint dot. This was a most important advance, and it placed the accomplishment of the catalogue beyond dispute. The next point was the question of plates for the chart; and the difficulty before them was as to whether it was advisable, in the present state of our knowledge, to extend the chart so as to embrace stars of the 14th mag., seeing how great was the difficulty in defining photometrically what a 14th mag. star must be. The difficulty had been avoided by deciding not to attempt any definition of a 14th magnitude star, but by limiting the exposure to forty minutes. But here a fresh difficulty arose, for plates of different sensitiveness might be used at different observatories, and the clearness of the air might also differ. So it was arranged that the Bros. Henry should experiment at Paris to find what exposure was necessary to give them good images of stars known to be of the 11th mag. Let us call this time $t$; then $n\,t = 40$ min. Each observatory would, in like manner, determine $t$ for themselves; but $n$ would be the same for all observatories, so that the exposure given would in each case correspond to 40 minutes at Paris. It was then resolved to push on with the catalogue plates. Six reference stars were to be selected for each plate—say 60,000 stars in all—which were to be observed with the meridian instruments of different observatories. A good deal of excited discussion took place on this point; but there was neither anger nor discord, and the decisions reached were arrived at unanimously. The grand result was, that a firm basis had been laid of a system of sidereal astronomy, for which their descendants of 200 or 300 years to come would thank them.

Dr. Gill then went on to describe the new equatorial coudé of the Paris Observatory—18 metres in length. It was a marvellous triumph of optical skill that such large plane mirrors should be so successfully worked. The great difficulty in using the instrument was that it required careful protection from the sun during the day, as an even temperature was essential to its good performance. Dr. Gill also referred to M. Loewy's determination of the constant of aberration, and to M. Cornu's repetition of the Cavendish experiment for determining the density of the earth. He had also visited the Berlin Observatory, and had spent much time in discussing with the Director the observation of the refereuce stars for the astrophotographic catalogue. But he would rather speak of the Potsdam Observatory, and the beautiful results obtained there in the spectroscopic determination of the motion of stars in the line of sight. After describing the spectroscope, the definitiou of which upon the suu was most exquisite, Dr. Gill said that Prof. Vogel had in this liue of research made, at oue step, as great an advance as that from the results of Ptolemy to those of Bradley, and he believed that, with a larger telescope, such as he hoped soon to be provided with, of 25 in. or 30 in. aperture, he would be able to obtain results which should resemble an advance from the days of Bradley to those of modern precision. He thought it not only possible, but probable, that ere long they would not be correcting the results of the stellar motions for the earth's orbital motion, but, reversing the process, would determine the speed of the earth's motion, and so determine the solar parallax, from the observations of the stellar motions in the line of sight.

Dr. Gill also said that he had visited Prof. Kapteyu at Groningeu, who was measuring and reducing the plates for the Cape Durchmusterung; 70 per cent. of the work was already accomplished, and by the end of the year he hoped the whole would be ready in catalogue form. The charts and catalogue would then be published as soon as possible, and they would be ready in time to help in the formation of the great Carte de Ciel.

Mr. Downing said that the reports of the proceedings of the Conference in the public press left the impression that the discussiou at times waxed so warm that the meeting had to be adjourned. He should be glad to hear Dr. Gill's account of the matter. He wished to know also, if an observatory simply took photographs for the chart, but did uot carry out the reductious, what was to be done.

Dr. Gill, in reply, said he had no hesitation in clearing up the misunderstaudiug. It would be easily understood that in so large a gathering of scientific men, each with his own views, various opinions would be very strongly expressed, and it soon became obvious that it would be necessary to discuss and arrange some points privately. For this purpose an adjournment was decided upon, but the ultimate resolutions were unanimously arrived at and most loyally accepted by all. With regard to the measurement and reductiou of plates, each director was at liberty to measure his own, and a committee had been appointed and was sitting to decide upon the best method of enlargement and publicatiou. Two or three members asked questions, to which Dr. Gill replied, and at the chairman's proposal a vote of thanks to him was carried by acclamation.

Rev. A. Freeman read a paper on "An Observed Partial Eclipse of Titan," May 5th. Favoured by unusually favourable weather, he had observed Titan shortly after superior conjunction, and had observed the satellite change from bluish-white tint, first to orange, and then to a dull copper colour, recovering through orange to its usual bluish-white tint. There was no simultaneous change in either Saturn or Rhea. This appeared to iudicate a partial immersiou of Titau in the penumbra and umbra of Saturn's shadow.

Mr. Green observed that this change of tint, corresponding exactly as it does with what is seen in the case of our moou during eclipse, might be taken to prove that Saturn had an atmosphere. Referring to the work of the new Saturn Section, of which he, Mr. Green, had just undertaken the direction, he remarked that he had noticed very clearly the white spot on Saturn's ring, but he believed that the appearance was merely the result of contrast with the body of the planet. Artists, if they wished to brighten the lights of a picture, often simply deepened the surroundiug shadows. It appeared to him that if it were a real spot on the ring, it should revolve with it.

Mr. Maunder read a paper on "Stars of the First and Second Types of Spectrum." Secchi's division of stars into four types was familiar to them all, and it had beeu generally assumed that these types represented successive stages in the development of a star, Secchi's type 1 being generally supposed to show the stage of highest temperature; or, in other words, to be typical of the largest stars. Recent discoveries had induced him to doubt if either idea were universally, or scarcely generally true. First of all, Sirian or first type stars were represented in a larger proportion amongst stars of the smaller magnitudes. Next, when double stars were of nearly equal magnitude, they were generally of the same colour and spectrum type; but if the companion was much smaller than the primary, then it was generally of the Sirian type, and the primary of the Solar or second type—never the reverse. Thirdly, when we calculated out the total radiation for those stars for which the parallax had been determined, we found that, on the whole, the solar stars were the larger, one solar star, Arcturus, being, indeed—if we accept Dr. Elkin's parallax —147 times as bright as Sirius. Lastly, the Milky Way was composed, so Prof. Pickering had showed, mainly of first type stars, and the Milky Way was obviously on the whole an aggregation of small stars. Thus, four distinct lines of research pointed to solar stars being usually larger than Sirian. Further, a method originated by Mr. Monck some years ago, enabled them to compare the mass—brightness of binary stars for which the orbits were known. This comparison gave solar stars as denser, in relation to their brightness, than Sirian. Then, again, different districts of the sky abounded iu special types of stars. Both these facts pointed, he thought, to the cause of the particular spectrum of a star lying rather in its chemical constitution than in the particular stage of development to which it had attaiued.

Dr. Gill remarked that the circumstance to which Mr. Maunder had alluded—the prevalence of first type stars in the Milky Way—had an interesting bearing on the photographic work they had been carrying on at the Cape. For, whilst their photographic magnitudes agreed fairly well with Gould's visual magnitudes, yet in the Milky Way they fouud a well marked constant difference. This was now explaiued by Prof. Pickering's discovery that the Milky Way was composed mainly of first type stars, which were, therefore, specially rich in the photographic rays. It was a most far-reaching discovery, and we did uot know where it would lead us; but the Milky Way would seem to be a separate creation from the rest of the stellar universe.

---

Newcastle-on-Tyne and Northern Counties Photographic Association.—The second out-door meetiug of the seasou will be held on Thursday, June 18th, to Ripon and Studley Park; train leaves the Central Station at 7·35 a.m.

Improvement in Microscopic Lenses.—It is stated, says the *Scientific American*, that au immense improvement has recently been effected in the manufacture of glass for optical instruments by means of the addition to the ordinary materials of phosphorus and chlorine, which, in some as yet unexplained way, cause the glass to be very much more transparent, aud euable it to receive a much higher degree of polish than any optical glass hitherto manufactured. Thus, microscopes can be made which will render objects of the diameter of only the one eight-millionth of a millimeter visible, whereas with the best instruments now in use the diameter of the smallest object that can be seen is one sixteen-thousaudth of a millimeter. This news, we fear, is too good to be true.

Mr. John Carbutt, of Philadelphia, has issued a circular to dealers in photographic materials, in which he writes:—"It is scarcely necessary to inform you that for the past twelve years I have manufactured and sold photographic dry plates bearing on their labels the letters A and B, which have become distinctive and recognised brauds of my manufacture, so that the use of the letters A and B had by ordinary usage become to me a valuable trade mark, aud photographers ordering my plates of those brands usually deemed it unnecessary to do more thau mention the brand required. As certain dry plate makers have recently made use of the same letters A and B on their labels, and the U. S. Patent Office having granted me the exclusive use of the letters A and B as a trade mark when applied to photographic dry plates, I hereby give uotice that I intend to maintaiu my exclusive right to the trade marks A and B as applied to dry plates, and will cause proceedings to be taken against anyone who infriuges upou my rights."

## Patent Intelligence.



### Applications for Letters Patent.

9,278. WILLIAM STRINGFIELD, St. Cyres, London Road, Lowestoft, "A New or Improved Method of Photographic Printing Direct from the Negative by Contact, Lantern, or otherwise."—June 2nd.

9,577. ALOIS DVORAK, 79, St. James's Street, Burnley, "Improvements in Detective Cameras."—June 6th.

9,591. WILLIAM PALMER, 87, St. Vincent Street Glasgow, "Improvements in Apparatus for Photographing Engineering Drawings aud the like."—June 6th.

9,598. WILLIAM LLOYD WISE, 46, Lincoln's Inn Fields, London, "Gauges for Centreing Lenses and Making other Optical Instruments." *(Andrew L. Smith, United States.)*—June 6th.

### Specifications Published.

304. *January 7th*, 1890.—"Coating Machines." F. BISHOP, 22, Soho Square, Middlesex, aud A. COWAN, Chase Side, Southgate, Middlesex.

The sensitive emulsion is contained in a trough, from the bottom of which it passes in an even layer to the plates, which are moved uuderneath. The trough consists of glass strips, the former of which is vertical, the other, which is inclined, being attached to a hot-water chamber. The strips are suitably held between end discs, fixed to the hot-water chamber, and by clamps, &c. The discs are mounted on couuterbalanced pivoted levers, which method of mounting permits the passage of different sized plates under the trough. In the case of large plates, the strip has a flexible tougue to compensate for the inequalities of the glass. The plates move between rollers on rails, which take under the edges so as to obviate defects due to local differences of temperature. The surplus emulsion runs over the edges of the plates into troughs, from which it falls into a tank underneath.

359. *January 8th*, 1890.—"Detective Camera." A. J. BOULT, 323, High Holborn, Middlesex. *(F. A. Brownell, Rochester, New York, U.S.A.)*

This belongs to the detective class, and can be packed into a box-form, by pushing the front, with its bellows, inside the case, and turniug up the base-board to close the open side of the case. When open for use, the base-board is held in position by two slotted stays, with spring catches; the front, with the lens, can be fixed in any position on guides, by a cam, for focussing. A finder, having a lens, mirror, and ground glass, is pivoted to one corner of the base-board, so that it can be examined vertically or horizontally. The roller slide case has a bead, which fits light-tight into a recess at the back of the camera. It is supported by pivots at the sides, which are supported in notches on the ends of pivotted springs. Any indicator, audible or otherwise, may be used. Recesses are provided for the admission of air when the bellows is exteuded. The roller of the slide is actuated by a key worked from the outside.

401. *January 9th*, 1890.—"Flash Lamps." T. H. REDWOOD, Bryn Coed, Crescent Road, Chingford, Essex.

Relates to light for photography, stage effects, &c. The flame from the lamp is spread out by impingiug on a metallic sheet or screen, on to which is ejected the magnesium, &c., powder by a deflector or diffuser on the powder nozzle. The lamp may be provided with a hinged cone or hood, a grating, and a damper, but any lamp or a gas jet may be used.

478. *January 10th*, 1890.—"Bottle Stopper." V. C. MONETTE, 23, Boulevard de Strasbourg, Paris.

For delivering liquid in drops or thin streams. Consists of a metal nozzle surrounded by india-rubber packing and provided with a lateral hole from which an air tube descends to the bottom of the bottle. The nozzle passage and air tube are controlled by a piston valve with push-knob and spring.

511. *January 11th*, 1890.—"Shutters." J. E. THORNTON and E. PICKARD, St. Mary's Street, Deansgate, Manchester.

Shutters adapting to lens hoods or mounts of different sizes. Rubber, &c., packing rings of the section shown, and of any required thickness, are inserted in an opening in the shutter frame, which may be provided with an adjusting screw. The strips are shorter along their upper than along their lower edges, so as to be firmly held in place.

611. *January 13th*, 1890.—"Magic Lantern." W. C. HUGHES, Brewster House, 82, Mortimer Road, Kingsland, Middlesex.

*Body.*—This is an open frame-work consisting of a base to which the front, with the tubes, may be set at right-angles, and held by stays; a pillar or pillars rising from the back of the base, carrying adjustable platforms for the lanterns. In a modified form, the platforms may be carried by pins instead of the pillar. The body can readily be taken to pieces for packing.

*The limelight apparatus* is carried upon platforms on the pillar, or the pins mounted thereon, and the dissolving valves or taps are adjustable on the pillar. These taps may be of the form shown, or may be fitted with T junctions, so as to be connected by flexible tubes which will not interfere with the vertical adjustment.

*The shutter* is mounted on a spindle, and is normally held in a position to shut off the light by a weight. When the slide is inserted in the stage, its end strikes au adjusting screw, and moves a sliding rack, thereby turning the shutter aside.

*The slide carrier* is provided with a pair of spring jaws, opeued by pressing a button through a double rack and pinion; the slide can then be iuserted in the carrier, and the jaws closing grip it in position. The guard plate has a bevelled edge round the picture, which may be coated with metal and highly polished. This gives the picture on the screen a clearer definition at its edge.

## Correspondence.

### AUTOMATIC PHOTOGRAPHY.

SIR,—I shall feel obliged if you kindly rectify in your next issue a few errors which occurred in your last article (otherwise impartial) on "Automatic Photography," viz:—

1st. That the premises which you were good enough to visit at Shepherd's Bush are not the head-quarters of the Automatic Photographic Co., but the factory of plaques used in automatic machiues.

2nd. That there is not in the above Company a managing, but technical director, which post is entrusted to me.

3rd. That our Company has actually a sufficient number of trained men to look after the machines and ensure their success.

Please also oblige me by mentioning that the rapidity with which sensitised plates develop and fix in the machines is due neither to collodion emulsion nor hydroquinone, but to a certain process unknown outside our Company, and improved by my own experiments and manipulations. L. NIEVSKY.

5, *Gransden Road, Shepherd's Bush, May 30th.*

### "SUGGESTED BY SOME RECENT EXHIBITIONS."

SIR,—Respecting Mr. Robinson's comments on the Gloucester Exhibition in your issue of May 29th, permit me, as the exhibitor of the picture in question, to protest against the imputation made in the third paragraph. To follow up the second paragraph by such remarks as are made in the third is a fairly direct way of imputing dishonesty to me. The paragraphs are too near together to convey any other meaning. The error arose from the use of the vague term "exposed" in the rule. I read it off, without a second thought, as applying to the *picture* to be exhibited. Had the rule stated distinctly that the enlarged negative as well as the print was to be the work of the exhibitor, all error would have been avoided. By the letter of the rule, all that lost my "very remarkable" picture the medal was my not having asked the firm who made the negative to permit me to remove the cap from the enlarging apparatus. This would have been "exposing" the enlarged negative. After all, what does the error amount to—the error that Mr. Robinson so conspicuously emphasises by italics and a note of exclamation? In this particular instance, the original negative, taken and finished by me, is the result of one exposure both in sea and cloud, and is absolutely untouched, and here any and all art ends in making a seascape or landscape photograph. The enlarged negative is simply a mechanical copy of this, to produce a thousand of which means nothing more than cash, with very little skill and not an atom of art. The picture exhibited by me at Gloucester was a 36 by 28 platinotype from such a negative, printed and in all respects finished by my hands alone. Taking the making of this picture, therefore, from the point of choosing the subject up to finishing the enlarged print, where is the justice or fairness in the comparsson to a man buying a painting and showing it as his own—the deliberate act of a cheat? The "respectability of the art," including that amount represented at the Gloucester Exhibition, has not, and, I trust, never will suffer through either me or my pictures. F. H. Worsley-Benison.

*June 6th.*

MESSRS. MORGAN AND KIDD'S WORKS, RICHMOND.

Sir,—We notice a slight error has crept into your otherwise accurate and admirable article on our works, in your issue of May 15th. Describing our method of making a bromide enlargement, and speaking of the operations after development, you say, "The picture has now a rinsing of very dilute acetic acid, and is immediately placed in the hypo bath." This is, of course, not correct. After rinsing with the acetic acid solution, it is very necessary to sluice the print well under the tap to get rid of the acid before it is passed into the hypo bath. Washing is *not* desirable between development and the acid bath, but *is very necessary* between the acid bath and the hypo bath.

The inaccuracy is slight but important, and as it may mislead some of our friends, if you can spare us space to make this correction, please do so. Morgan and Kidd.

*Kew Foot Road, Richmond, S.W., June 8th.*

## Proceedings of Societies.

The Photographic Society of Great Britain.

At the meeting of this Society held on the 9th inst., the chair was taken by Mr. James Glaisher, F.R.S., president.

Capt. Abney read a paper on "An Undiscussed Point in Dark Room Illumination." He commenced by saying that it might be thought that there was nothing further to say on the subject of dark room illumiuation, and that the subject had been thoroughly threshed out a few years since. He had recently, however, made some experiments which threw some light upou the reason for the comparative safety of rays removed from the red region. He had formerly expressed his opinion (which he still held) that dark orange was better than ruby, which was at that time mostly employed. Then came the advocates of canary medium, and Mr. Debenham had employed a light in which green took part. Some time since he was surprised to find, in a manufactory of dry plates, the amount of cauary light that was used with safety. In making experiments with other objects in view, he had recently met with results which very much explained the efficiency of green and yellow light when of low intensity compared with red. He had found that there was an enormous difference in the amount of light necessary when using different colours in order to produce visible illumination. Takiug rays of each colour of such a strength as to appear equal to the eye when powerful or moderately powerful, wheu they were severally reduced in amount, the proportion of visibility no longer held good at all. After diminishing, say the red, to such a quantity as to just cease to visibly illuminate a white screen, it was found that green might be reduced to about one thirty-sixth part of this amount before its illuminating power ceased. Other instances could be seen from the following amongst other tabular results that were given :—

| | |
|---|---|
| Red ... ... ... ... ... ... | 3,500 |
| Orange... ... ... ... ... ... | 1,000 |
| Yellow ... ... ... ... ... ... | 600 |
| Green ... ... ... ... ... ... | 105 |
| Blue ... ... ... ... ... ... | 5 |
| Violet ... ... ... ... ... ... | 20 |

That is to say, that whilst 3,500 uuits of red light were required to make an object visible, 1,000 of orange, 600 of yellow, &c., sufficed for the same purpose. Another table, showing the illuminating power of mediums in actual use for dark room purposes, read as follows :—

| | |
|---|---|
| Ruby ... .. ... ... ... | 40 feet |
| Stained red ... ... ... ... | 120 ,, |
| Canary medium ... ... ... ... | 220 ,, |
| Orange paper ... ... ... ... | 180 ,, |

The second column showing the distance to which a screen might be moved from the source of illumination before becoming invisible when the several mediums were employed. These results explained pretty evidently why, when canary medium was used, the corners of the dark room were so much better illuminated than when ruby light was employed. The question was one of physiology, and it had before been recognised that the rays of the more refrangible end of the spectrum affected the sensitive nerves when much more diluted than those of the red region, but he did not think that there had been any idea that the difference in this respect was so great as he had found it to be. The difference amounts to a proportiou for certain rays of from 700 to 7,000 to 1. If pure green light could be used, that would be best; but the light transmitted by any of the mediums in use was far from pure, and the results, therefore, were only approximately true with regard to the proportionate sensitiveness of the eye to pure rays. A point to be noted was that wheu light of any colour became faint, it appeared to be white. With various colours, however, the value of this effect was very different. With red, the effect of whiteness only came in just as the light was on the verge of disappearing, whilst with green, the light appeared white some time before being extinguished.

An apparatus for measuring the amount to which a light of given colour might be reduced before ceasing to give visible illumination, was shown and explained, and the effect examined and noted by the President, by Mr. Spiller, and by Mr. Debenham. With all three observers, the green disappeared at about the same point, which, upon measurement, was found to be when it was reduced to about a thirty-sixth of the intensity that had been found necessary for red.

Mr. J. Spiller asked whether, in view of these experiments, it was not a mistake to use—as was done—green for a safety, and red for a danger signal? The danger was what it was important to see when feebly visible, as at the greater distance, and it now seemed that green fulfilled this requirement so much more than red, and should therefore rather be the colour to indicate danger.

Capt. Abney replied that the question of signal lights was very different from that of the illumination of the dark room. Brightness and illumination were not the same thing.

Mr. Debenham added that signals were especially required in foggy weather, and red had the power of penetrating through fog particles much more thau the colours of the other parts of the spectrum.

Capt. Abney confirmed this view, and continued that the great danger with green was, that it appeared white when seen through a fog. Green was much more scattered by fog particles thau was red.

Mr. Cowan asked Capt. Abney whether there was any foundation for the statement so often put forward, that the proportionate intensity of a uegative was altered according to the amount of light used to print or enlarge with it.

Capt. Abney replied that the eye and the photographic plate were by no means the same thing, and physiological causes affected the one and not the other. So far as his experience went, he would say that the effect he had referred to had nothing in character with that on the photographic plate. Within usual limits, he would say that there was no alteration on the effect of the intensity of a negative by alteration of the strength of the light. When they went to extremes—say a difference of from a few seconds in one case to four hours in the other—he thought there was a slight difference, but so slight as not to be discoverable without special means of observation.

Mr. Spiller mentioned that some eighteen months since he had taken a dose of santonine as an experiment, and found that everything appeared green in colour. Was that due to any colouration of the vitreous humour? He would add a caution to others not to repeat the experiment on account of the effect on the nerves.

Capt. Abney said that there was no colouration from santonine, but a paralysis of the violet-sensitive nerves, causing a certain amount of colour-blindness. Colour-blindness was also produced by excessive use of tobacco, particularly by such tobacco as cavendish, and, from his recent experiences in making examinations, he should say that tobacco colour-blindness was much more common, at all events, in some parts of England, than congenital colour-blindness.

Mr. Chapman Jones said that as a practical detail he would mention that the yellow fabric now manufactured was not of the same colour as that first sent out, but was more orange, and, in his estimation, far inferior. He mentioned this in the hope that the attention of the manufacturers would be directed to the subject, and that they would reproduce the original colour.

Mr. Debenham felt grateful to Capt. Abney for the research which had led to the explanation of the cause of the safety of illumination from the yellow and greenish yellow region. The physiological question was one of essential importance in the enquiry.

The President said that the subject of dark room illumination was one in which he had always taken great interest. He thanked Captain Abney for the paper. He read a communication from Mr. Leon Warnerke, who had arranged to read a paper ou "A New Sensitometer," but was prevented by an attack of influenza from leaving the house. The sympathy of the president and of the members having been expressed, the president vacated the chair, which was taken for the remainder of the evening by Mr. J. Spiller, vice-president.

A letter from M. Leon Vidal was read with regard to the recent discussion on polychromatic impressions. He said that it had been stated by Albert and others that polychromatic impressions could be produced by photography by using plates made with colour screens, and without masking or retouching parts of them. He did not doubt this, but the question was, were such impressions identical with the originals? He believed not, but if proofs that they were so could be produced, he should be pleased to examine them. He also sent specimens of various separate colour impressions to form an image, and explained that several plates would be necessary, and that three would not suffice. In the one sent, ultramarine was used as the blue, but the colour, although suitable for the dress, was not so when used with yellow to form green for the grass. If, on the other hand, Prussian blue was used, the grass would be right, but not the dress.

Mr. Debenham thought that where colours were used as separate plates to form other colours by mixture, these colours should be transparent. Ultramarine, as an opaque colour, would not make a good green, but Prussian blue, on the other hand, should be more suitable all round.

Capt. Abney said that opaque colours produced muddy mixtures by reflecting some white light along with that which belonged to them, and which they received from adjacent particles of the other colours with which they were mixed. As to polychromatic impressions generally, if they were to resemble such abortions as the landscapes hanging on the walls, we should be better without them. There were, however, others—some figure subjects particularly—which were remarkably fine. On the subject of colour, he called attention to a criticism by Dr. Phipson, in the *Moniteur de la Photographie*, on a recent lecture by Mr. Debenham. In the criticism, Dr. Phipson charged him (Capt. Abney) with putting forward as something new an old theory of colour belonging to the beginning of the century. There was not the slightest foundation for such a charge, and, with regard to other remarks by Dr. Phipson, he could only be surprised that anyone should venture to put them forth.

A lamp for developing purposes was received from Messrs. Benham, as well as contributions to the library from Messrs. Vanner, Sheppard, Cembrano, and Warnerke, and the thanks of the meeting recorded.

Messrs. D. R. Charrington, T. W. Harrold, and J. Howson were elected members. It was announced that on the 23rd inst. there will be a discussion upon orthochromatic photography.

### Camera Club.

On June 4th, Mr. Maskell read a paper re-opening a discussion on the matters treated in Mr. Pennell's paper ("Photography as a Hindrance and Help to Art") read at the late conference. Capt. Abney occupied the chair. Mr. Penuell himself attended.

After Mr. Maskell's paper, one by Mr. A. Burchett was read, and a very keen discussion followed, in which the Rev. F. C. Lambert, Messrs. F. E. Barber, Pringle, England, Willis, J. S. Whatton, Davison, Teasdale, Hinton, and Major Nott, Rev. A. B. W. Whatton, Dr. Patterson, and the Chairman took part.

Mr. Pennell replied, and the meeting broke up after a vote of thanks to Mr. Pennell aud Mr. Maskell.

### Holborn Camera Club.

At last Friday's meeting, Mr. E. H. Bayston in the chair, Mr. Herbert Thompson read a paper on an "Ideal Hand-Camera," offering suggestions which the writer thought would be improvements on some of the hand-cameras at present in the market, especially in regard to the finder, the lens, and the shutter. Au interesting discussion followed, chiefly on the use of hand-cameras, in which Messrs. Bayston, Golding, Luxton, Benest, and Raphael took part.

Mr. J. Bush was elected a member of the Club.

### Brixton and Clapham Camera Club.

A meeting of the Club was held on June 4th, Dr. Reynolds, vice-president, in the chair.

Mr. W. H. Powell gave au interesting paper on "Hand-Camera Work," and explained the use of several hand-cameras, amongst others, Messrs. Marion's "The Radial," aud Mr, Cusworth's "Repeater," which had been lent by their respective makers.

Mr. J. A. Butler, one of the members, also exhibited an excellent one made by himself, which attracted considerable attention.

### Putney Amateur Photographic Society.

*June 3rd.*—The first monthly summer meeting for the election of new members and discussion of subjects of interest was held, with the Rev. L. Macdona in the chair.

The following were elected as members: Messrs. Brothers, Handcock, Searle, Trengrouse, and Miss Parsons. Dr. Sheppard was elected to fill the vacancy on the Council caused by the resignation of Mr. Manifold.

Next excursion, Saturday, 13th inst., to Burnham Beeches.

### North Middlesex Photographic Society.

On the 6th inst. a few of the members took part in the field-day to West Hampstead, a district where furze, heath, fern, and broken sandy ground afford variety to the foreground, while middle distance and far-extending vistas meet the photographer from every point of view.

On Monday, the 8th inst., Mr. H. Walker in the chair, Mr. J. Traill Taylor addressed the Society on "Faults in the Composition of Photographs." Mr. Taylor dwelt upon the faults to which the photographer is most prone, showing numerous prints illustrating his points, aud showing how, by reducing the expanse of uninteresting foregrouud, many an unsatisfactory view might be transformed into a picture. He pointed out that repeated straight lines and geometrical arrangements were wearisome to the eye. Dealing with the division of land and sky, he showed that while, as a rule, the horizon should be below the centre, that this was an arrangement largely affected by the composition of the picture generally. Touching upon portraiture, the lecturer dealt with the arrangement of single figures and groups, advising his hearers not to yield to the pressure of their lady friends to make the details of the dresses the principal attraction, but to throw central interest upon the face.

Prints from views taken by the members at Hale End were passed round, and a vote taken as to merit.

Three members were elected, and two nominated.

On Monday, the 22nd inst., Mr. F. L. Pither will read a paper on "Art in Landscape." Visitors welcome.

RICHMOND CAMERA CLUB.

At the meeting on the 5th inst., Mr. CEMBRANO presided.

A demonstration of toning celerotype paper was given by Mr. Blackie, of the Blackfriars Sensitising Company, who also showed some fine finished prints, and distributed samples of the paper amongst the members present.

The Chairman showed some beautiful transparencies of the Alcazar of Seville, and the Alhambra.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).

*June 5th.*—Mr. J. A. CARTER, M.A., in the chair.

No paper being down for this evening, results of the past excursions were shown by the members. Mr. WEIR-BROWN exhibited some bromide enlargements toned by uranium, and mentioned, with reference to mounting prints toned in this way, that care must be taken not to damp the face of the print when mounting, as a stain is left when the print has dried, and if by chance the face of the print did get damp he used a damp (wrung out) sponge, and then the face of the print was made equally damp all over.

Mr. CARTER asked if it was necessary to always damp the prints.

Mr. WEIR-BROWN said a sizing of starch at the back of the prints would prevent moisture, when mounting, from appearing on the print.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held at the Masonic Hall on June 2nd, Mr. B. J. TAYLOR in the chair.

After the transaction of ordinary business, the PRESIDENT gave a practical demonstration on toning and fixing gelatine chloride emulsion paper, and Mr. T. G. Hibbert demonstrated with the ordinary albumenised paper.

Mr. HIBBERT brought before the meeting an interior printed on Obernetter paper, which was admired.

LOWESTOFT AND DISTRICT PHOTOGRAPHIC SOCIETY.

*June 5th.*—Mr. W. STRINGFIELD in the chair.

The Rev. A. WELLS exhibited some interesting slides, illustrating his travels in Constantinople, Florence, and elsewhere.

Mr. ESTCOURT gave a further instalment of his stereoscopic views of Burnham Beeches, the tone and quality of which were excellent.

Mr. A. M. SMITH also produced some half-dozen slides, evincing careful work with due appreciation of the artistic.

LEWES PHOTOGRAPHIC SOCIETY.—At the Fitzroy Library, on June 2nd, Mr. E. J. Bedford gave a practical demonstration of "Development by Eikonogen." Mr. Bedford exemplified the powers of eikonogen by developing bromide paper prints, lantern plates, and also ordinary negatives, admirable results being obtained in each instance.

MESSRS. GEORGE HOUGHTON AND SONS, of Holborn, have sent us a specimen of Shenstone's patent focussing cloth clip, for which they are sole agents. This ingenious contrivance consists of a kind of metal frame, the distance between the uprights of which can be varied, while, by the action of a spring, they tend constantly to approach one another. Sewn into the hem of the focussing cloth, this frame firmly grips the camera, so that the operator can defy the most aggressive wind, and have both his hands at liberty. The attachment does not materially add to the bulk of the focussing cloth, and it is so constructed that it folds into small space. It will be found a most useful aid to outdoor work.

# Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the PHOTOGRAPHIC NEWS, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

F. R. M. S. — *The Weather in May.* The rainfall for North London was rather above the average, and amounted to 2·79 inches. The low temperature and loss of sunshine were more remarkable. There were twenty rainy days, May 17th and 24th being very wet. The month compares favourably, however, with the corresponding period of 1889, when the total rainfall was 3·58 inches.

R. D. P. (Stafford).—*Dammar Varnish and Marking Ink.* Gum dammar is only partially soluble in alcohol and ether, but dissolves freely in warm turpentine, giving, however, a tacky varnish, or one that may dry too slowly for your purpose. Try pure benzol or methylated chloroform, either of which is a good solvent and dries quickly. *Marking Ink for Linen.* Eighty grains each of silver nitrate and cream of tartar are well rubbed together in a glass or Wedgwood mortar; after a short time add 5 drms. liquor ammonia, and when dissolved, mix in 60 grs. loaf sugar, and 100 grs. of powdered gum arabic, with a little sap green or indigo to colour the ink; after which add enough water to make up the bulk to exactly one ounce. Preserve in a stoppered bottle. Write with a quill pen, and develop by holding near a fire or passing over it a warm iron.

M. L.—*A Good Mountant.* Soak broken pieces of cabinet glue in a large bulk of cold water until thoroughly soddened. Pour off the top liquor, and melt the softened glue by gentle heat over a water bath; now add very gradually and with constant stirring about an equal bulk of methylated spirit, until all becomes smooth and free from clots. When cool, transfer to tightly corked bottles for use. With this mountant the prints do not cockle perceptibly on drying.

ANNE.—*Palpable Retouching.* The proof shows, even through the encaustic paste, the alteration that you complained of, which could quite well have been touched out in the negative. This can yet be done if more prints are required. What induced you to appear in a "cob-web" veil of such very pronounced fashion? Is it considered an improvement, like the patches of court-plaster worn by your maternal ancestors?

L. E. (Folkestone).—*Impure Silver.* The lump of reduced metal, which you say is quite black, is probably rendered impure by the presence of sulphur. In any case, fusion with borax and nitre will be the best way of refining it. By dissolving it up as it is in nitric acid, the amount of sulphate formed might be sufficient to forbid its use in photography.

OLD AMATEUR.—*Paper in Continuous Rolls.* Since replying to you a fortnight ago, we find that Messrs. Joynson & Sons, of St. Mary Cray, Kent, advertise the production of drawing paper in continuous lengths, which might very likely suit your purpose.

GREENLAND.—*Cryolite.* Many years ago this mineral, which is a double fluoride of aluminium and sodium, was used for the direct production of aluminium, but now its employment is restricted to its use as a flux in the purification of that metal.

PHOTOMAN (Paris).—*Abney's Collodion Emulsion.* Another formula, given in Captain Abney's "Treatise on Photography," 1888, fifth edition, p. 118, prescribes almost exactly the same ratio of zinc bromide to silver nitrate as that already reported to you, viz., 5 to 8·5.

T. M.—*Dr. Percy's Portrait.* We are told that Mr. Walter Adams, of Blagrove Street, Reading, has an excellent portrait of the late Dr. Percy, reproduced from an early Daguerreotype.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1711.—*June* 19, 1891.

CONTENTS.



## DARK ROOM ILLUMINATION.

Captain Abney's experiments with differently coloured media for dark room illumination, as explained by him at the last meeting of the Photographic Society, and reported in our last week's issue, may be regarded as an important contribution to photographic knowledge. As he himself said, it might be thought that the subject had already been thoroughly threshed out, but he was able to show that this was not the case, and that there was really a point in dark room illumination which had not before been discussed. Captain Abney's remarks remind us that, although much has been written regarding dark room illumination, it is a subject which too many photographers pay little attention to. It is surprising that such should be the case when it is remembered how much their personal comfort depends upon suitable lighting of their room, and how much their daily work must suffer if a good light is not secured.

It has been our fortune to visit very many dark rooms belonging to both professional and amateur workers, and we have too often found that the amount of red light available is so stinted that it is a wonder that any good work can be done. In one or two flagrant cases of darkness made visible, the light has been so bad that we have no hesitation in saying that the worker would have been as well off, so far as development is concerned, if the light had been shut off altogether. In such an extreme case as this, it stands to reason that the operator must throw his developing fluid on the plate and simply leave matters to take their chance. He is, of course, aware that the exposure is approximately right, and that a developer of certain strength and composition may be trusted to bring out the image in a certain time. He is content, in fact, to leave the building up of the image to itself, and does not exercise any control over it. Under such circumstances photography becomes the mechanical thing that its enemies are so fond of calling it, and the operator reduces himself to the level of an automatic machine.

All earnest workers agree that it is during development that care is necessary if a good negative is to be expected; but this care cannot possibly be exercised as it should be unless there is sufficient light in the dark room to show the progress of the operation. And there is no reason whatever why the light should not be plentiful, so long as it is of the right quality. We admit that there is some difficulty in rendering daylight safe, and, at the same time, allowing sufficient illumination for the dark room, for the light in our climate alters to such an extent from day to day, and from hour to hour, that at one time one thickness of medium may be sufficient to protect the most sensitive film, and shortly afterwards three or four thicknesses may be necessary to secure the same result. For this reason it is, perhaps, best to depend upon artificial light, and, when possible, gas is by far the best for the purpose.

Another point in dark room illumination which is too often neglected is the position of the light with regard to the worker. Many lamps are so made that the flame is almost on a level with the table or work bench, instead of being, as it should be, some inches above that level. The light should be thrown down upon the developing dish. Another important point also sometimes lost sight of is that the actual flame of the lamp should not be seen; in other words, the medium employed should not be clear, but semi-opaque. A medium of this latter character, whether it consist of paper, textile fabric, or glass ground on one side, has the advantage of diffusing the light in such a manner that the room is better illuminated than if the flame were actually visible. Besides this obvious advantage, the gain in shielding the actual flame from the eye cannot be over-estimated.

We advocate the use of gas when it is obtainable, because, all things considered, it is the best possible illuminant for the dark room. It is clean in use, and is, perhaps, the safest form of artificial light known. It should be used with a bat's-wing burner in a lantern that should measure at least eighteen inches square. This lantern should be well ventilated, and, if possible, the burnt air should be carried outside the dark room. The supply pipe for the gas should be furnished with a tap *outside* the lantern within easy reach of the hand, for one of the greatest advantages in the use of gas is the power which one has of turning it up and down from a feeble flame to a powerful one. Everyone knows that a partially developed plate will stand without injury double the amount of red or orange light which it did when first placed in the dish. Such a lantern as we have described can have each of its sides furnished with a different medium—say deep red, orange, and yellow—so that the operator can suit his light according to the sensitiveness of the materials which he may be handling.

If, with all the precautions to which we have adverted, the operator should still have some misgivings as to the safety of the light he is using, he has still the option of protecting the developing dish with a piece of card, which should always be at hand for the purpose. It is astonishing what a flood of light can be indulged in with impunity if the operator is content to glance at his plate only now and again, and will take care that during the first part of the developing process it remains as far as possible under cover.

## THE OPTICS OF THE LANTERN.*

BY J. TRAILL TAYLOR.

From the canal boat to the White Horse is a transition not any more pronounced than is that of the lantern of half a century ago to that of the present period. *Then* a wonderful magical toy; *now* a philosophical instrument replete with huge possibilities of education, art, and amusement.

Some time since, Mr. Pringle discoursed before this Club of the lantern: its illuminants, mechanics, and applications. The duty assigned to me to-night is one of much narrower scope—its optics—and to this theme I shall confine myself as strictly as possible. Lantern optics take cognizance of the light, from its genesis at the lime or other radiator, to its ultimate destiny or termination on the screen, these termini constituting the alpha and omega, or, in optical parlance, the conjugates of such optical system as may intervene.

I shall assume the existence of the light, which, for the sake of simplicity, may be that emitted from incandescent lime. Now, as its rays radiate in every direction, the first consideration is the collecting as many of these as possible, and causing them to travel in just the direction we desire. If only a few of them—in other words, a narrow angle of illumination—be our requirement, the problem of their forward transmission is one of extreme simplicity; but if, on the other hand, the greatest possible angle of illumination be the desideratum (and of course this is the case), then does the problem become slightly more involved. We cannot here institute a comparison between the methods adopted by lighthouse engineers in utilising all their light, and those demanded by the lantern, for in the latter case it is to be employed in the formation of an optical image, whereas in the former it is merely projected into space, and both direct light from the radiant, together with that reflected from either a holophotal or a parabolic reflector, are available. But, while we cannot utilise so much of the light as in the lighthouse, we can use it to much greater advantage for our special purpose.

* A Paper read before the Camera Club.

We now require the greatest angle of light possible to be got advantageously through a condensing system, for this lies at the root of the whole matter, and in doing so have to ascertain how near can the light be approximated to the first surface with safety. From innumerable trials with lenses of a thickness not too great, and set with such a degree of looseness in the brass work as not to be cell-bound, I find that two inches may be considered as quite safe. When condensers crack, it is usually the result of their being too tightly burnished in their cells, brought too suddenly under the influence of the heat of the radiant, or being subjected to currents of cold air. I assume, of course, the perfect annealing of the glass of which they are formed. When this last point is dubious, it may be well to adopt the system employed by the Scotchwomen of a former period, who, when laying in a supply of tumblers intended for whisky toddy, invariably placed them in cold water, which was slowly brought to a boil, and then allowed to cool slowly, by which treatment immunity from subsequent breakage was believed to be ensured.

At this stage we proceed to analyse the functions of a lantern condenser—so-called. We find that these are (1st) the collecting, and (2nd) the condensing of the light. Of these the former is much the more important. What we wish done is the collection of so many rays as to form a large angle, and their projection forward is as near an approach to parallelism as possible. Absolute parallelism cannot be obtained unless the flame were a point, instead of being, as it is, a disc or patch having sensible dimensions of, say, a quarter of an inch upwards.

Some of the cheap French condensers (of which I would not speak disparagingly, for they render excellent service, and are marvels at their price) transmit an angle of light of from 40 deg. to 50 deg., and a higher class of London-made articles claim, I understand, to embrace 60 deg. But, by a slightly increased expenditure of optical means, it is possible to increase this angle to 95 deg., which, I need scarcely observe, somewhat more than doubles the intensity of the illumination. Let us see in what way this is to be accomplished.

Kepler's law, as you all know, is that the focus of a plano-convex lens equals the diameter of the sphere of convexity. This is, of course, for parallel rays, and it is those we are dealing with at present; and we are also dealing with plano-convex lenses, these being the best for condensers, subject, perhaps, to a slight hollowing of the flat surface, of which I shall soon speak. Well, it is very evident that, if we desire a large angle of light, the single Kepler won't do much for us, unless, indeed, it was made enormously thick—even hemispherical—when we would encounter two evils: first, the enormous spherical aberration consequent upon transmitting light through a bull's-eye; and secondly, the proximity of the said bull's-eye to the radiant, which not only emits light, but heat—a heat which would quickly cause our bull's-eye to see stars and stripes. How, then, is it to be accomplished? By borrowing the ideas of the microscopist. Did any of you ever hear of a microscopic objective of even the most distant pretensions to wide-angle being composed of one lens? Can you conceive of such a thing? Well, no more is it possible in our collecting system, which is analogous. We must have at least two lenses for our purpose. One of them—that nearest to the light—must be 4½in. in diameter in order to catch up the 95 deg. of which I spoke. But this cannot render the rays parallel;

still, it transmits them to its colleague under such circumstances that *it* does so, the two lenses thus doing what no one singly could effect.

[The lecturer here submitted drawings made to scale, and transferred them to the black-board.]

The first lens of the collecting system is comparatively thin, which, apart from any optical advantage, is useful in this respect, that it has to bear the first impact of the heat; and, as you can readily understand, this lessens the liability to fracture. It is only sixteen m.m. ($\frac{5}{8}$ in.) thick in the centre, is 8 in. to 9 in. focus, and is formed (by preference) of flint glass. The second element is 5 in. in diameter, and, the radius of curvature being rather shorter, this, combined with its greater diameter, causes it to be proportionately thicker, being twenty-eight m.m. ($1\frac{1}{16}$ in.) at its centre, and 7 in. focus. This lens, too, should be made of colourless glass. The loss of light from absorption is but little, and I anticipate an objection that might be suggested as to that from oblique incidence. This is really so little as to be unworthy of notice, but it carries with it its compensation; for it occurs most at the thinnest portions of the lens, where there is the least absorption, and thus aids in ensuring uniformity of illumination throughout the entire beam. But it may be reduced by rendering the first surface concave instead of plane, and retaining the balance of power by grinding the back surface on a tool of shorter radius. I at one time was madly in love with the meniscus form of lens for this purpose, but, incited thereto by the experience of Dr. H. Morton, and after many trials with lenses both plano and meniscus, and formed of different kinds of glass, from St. Gobian's crown to English flint, I arrived at the conclusion that the plane surface answered every purpose in an effective manner.

If the radiant were infinitesimally small, a parallel beam of a large collected angle could be transmitted with a singular degree of perfection for several yards. With a triple collecting system (that worked out by Dr. Charles Cresson, in which the first lens is a plano-convex $4\frac{1}{2}$ in. radius, the second a meniscus, respectively 30 in. and 6 in., and the third a crossed lens of 52 in. and $8\frac{3}{4}$ in. radii) I projected across my bedroom a very tiny gaslight on to the dial of a French clock, which was thus illuminated a whole season. But such extreme nicety is not required in the practical working of the optical lantern, as, owing to the magnitude of the flame, two elements answer every purpose. The two that I have described should be mounted together as closely as possible, fixed permanently in the lantern, and must always be used together, and not separate. Until a compound collecting system of this nature is tried, one can form no idea of the capabilities of the lantern for certain scientific purposes, such as polarising.

*(To be continued.)*

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—June 23rd, at 8 p.m., subject for discussion, "Orthochromatic Photography." The Rooms will be closed from July 29th to August 4th. The exhibition of photo-chromo work will remain open daily between 2 and 9 p.m., till the 30th inst.

DROPS.—The size of drops varies from various causes, of which the nature of the liquid, the size and shape of the lip of the vessel from which dropped, the extent to which the lip is moistened, and the rapidity of dropping, are the most important. This is, therefore, an uncertain mode of estimating the quantity of liquids, and should be superseded where minim measures can be had.—Quoted in *American Druggist*.

## ROYAL CORNWALL POLYTECHNIC SOCIETY.

THE fifty-ninth annual exhibition of this Society will open at Falmouth, on Tuesday, 25th August. Medals and prizes are offered in various departments, including photography, professional and amateur, photographic appliances, &c.

The following are the general regulations:—

1.—All exhibits must be forwarded so as to reach the Polytechnic Hall, Falmouth, not later than Tuesday, August 18th, after which no article will be eligible for competition, and no space can be guaranteed.

2.—All pictures and photographs must be framed; and if left at one of the following places of the Society's authorised agents on or before Tuesday, August 11th, will be conveyed from these depôts to and from the exhibition, free of charge, namely:—Messrs. Worth and Co., Cathedral Yard, Exeter; Messrs. Harris and Sons, 70, George Street, Plymouth; Messrs. J. Mitchell and Son, 15, Bedford Street, Plymouth; Messrs. Thomas Solomon and Co., King Street, Truro. (The above agents will not receive any article unless delivered to them free of conveyance and other charges.)

3.—The carriage of all other articles must be paid by the exhibitor.

4.—All cases and packages sent to the exhibition must be addressed "The Royal Cornwall Polytechnic Society, Falmouth," and must bear the name and address of the owner; the covers to be fastened with screws. The exhibitor must write on the back of each picture his name and address, its title, whether it is an original or a copy, the name of the artist, and whether he is a professional or an amateur. The works of professional artists may be sold from the gallery, through the secretary of the Society, Mr. E. Kitto, and a commission of five per cent. will be charged thereon.

5.—Exhibitors must enter all articles intended for exhibition on forms provided for that purpose by the Society, which may be obtained from the secretary, or any of the above-named authorised agents.

6.—This entry form must in all cases be returned to the secretary on or before August 8th.

7.—The Society will not be answerable for loss of or damage to any article sent to the exhibition, but every care will be used to prevent injury while in the Society's possession.

8.—After admission no article may be removed until after the close of the exhibition. [*This regulation does not apply to the photographic department for this year.*]

9.—Discretionary power is vested in the officers of the Society as to exhibiting any article sent.

10.—Board of Trade Protection is granted to all new and unpatented inventions.

The following has special reference to photography.

In all cases state whether the work is professional or amateur, and name process of production. All work sent for competition must have been executed within eighteen months of the date of this exhibition. Carte-de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty.

*Professional Photographers.*—Medals are offered by the Society for meritorious productions in the following subjects:—Landscapes, portraits, composition pictures, instantaneous pictures, interiors, transparencies for window decorations, pictures by improved processes, enlargements—portraits, enlargements—landscapes. All enlargements for competition must be the work of the exhibitor,

*Amateur Photographers.*—Medals are offered by the Society for meritorious productions by amateurs in all the above named subjects except for enlargements (portraits.)

*Photographic Appliances.*—Medals are offered for improved apparatus and appliances. All exhibits in this department must be accompanied by a written explanation of their special features.

Information respecting the photographic department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate (member of the General Committee).

## THE PHOTOGRAPHIC EXHIBITION AT THE AUSTRIAN MUSEUM.

BY JAMES VON FALKE.

It is well known that in pictures by the Chinese the near and the distant, foreground and background, are all represented equally clearly and definitely. The reason is not a want of knowledge of perspective, for the Chinese has his reason, which is seemingly quite good and plausible. He says it is a mistake, a failing in our eyes, if we do not see the distant as plainly and exactly as the near, and it is the duty of art to correct this failure—it can do so.

Until now, photography in a certain sense has had the same point of view as the Chinese. It made a trial, and found its duty to be to represent all objects, near or distant, as clearly and sharply as possible. And in this direction it certainly has attained the most wonderful perfection, in which no human eye will ever follow it. Will the eyes ever be able to see a rifle ball in its flight, the waves of air before and behind the ball, the opening and closing of the air before and behind the flying ball? The photographic machine not only sees that, but fixes it. Thus, photography has made the apparently impossible possible. It teaches us to see things we never could have seen with the naked eye. It draws for us the heavenly bodies, every leaf on the tree, every blade of grass; it counts, as it were, the hairs of our heads, and considered photographically that is very satisfactory, considered artistically very Chinese. No objection could have been taken to this had photography been satisfied to be a useful art. It is not contented with portraying everything on earth that lives or does not live, but it will make pictures, pictures in an art sense, but in the so-called Chinese manner the sun will not work.

From this artistically right feeling has arisen among photographers a new tendency, that of the "impressionists," after the nature of the "impressionists" among painters.* It is not a question of what photography can achieve in clearness and distinctness, but of what the human eye sees; it is the impression made on us which should be fixed. We see what is near more distinctly, and the remoter things gradually decrease in distinctness and finally become "verschwimmen," and then disappear; we see air intervene, surround things, soften down light and shade, and make them run into one another. It is this which photography also, if it will be an art—will produce pictures—must represent, subjective not objective truth, things not as they are in themselves, but as they are seen, especially by the artist's eye.

It is this newly-awakened contrast in photography as a graphic art which makes this exhibition of the Club of Amateur Photographers at the Austrian Museum so interesting. Doubtless it is the first time that this contrast appears so decidedly without being expected or intended. This year's international exhibition of the Club of Amateur Photographers, its second, has a purely artistic purpose. Only that was to be exhibited which is acknowledged to be artistic, picturesque, satisfactory, or excellent.

With this intent was formed a jury of artists, painters, and sculptors, who would probably regard the photographs differently from what photographers would. The purely technical was not taken into consideration; all that the artist-eye recognised as artistic was retained. Photography had to prove itself an independent art, as much a means of art as are all colours, indian ink, water-colours, brush, and pencil; but also the photographer had to prove himself to be an artist; and both proofs have been brought. It is true that of the 4,000 photographs sent in, only 600 were hung. The rest fell victims to the eye and judgment of the artist-jury; but, indeed, these 600 afford the purest and finest artistic enjoyment; too fine, perhaps, to make the exhibition popular, as it deserves to be.

Among the 600 photographs, landscape greatly predominates; and again, among the landscapes, English ones. In the second place, come the genre pictures, mostly in connection with landscape scenery; in the third place, portraits. The heroic and historical picture is, of course, absent, for the present, and its history does not present it to the photographer, and he cannot himself compose such a historical picture—say, of a battle. It would be necessary to direct him to an agitated sitting of parliament, such as does happen now-a-days; but it would be somewhat tedious to stand with the apparatus, and wait for such a dramatic moment, like the Englishman who travelled about with a lion-tamer, waiting for the moment when the lion should seize the tamer's head in its jaws; but even in the life of a legislative assembly, such precious moments are not all too numerous.

But landscape is present to the photographer everywhere, and stands still for him; yet he must know how to catch nature, and must have an eye for art; and indeed, these amateur photographers, ladies and gentlemen of the finest breeding, partly from the most elegant circles of human society, have understood how to catch nature, both in her familiarity and her grandeur. As exhibitors *hors de concours*, we find the patroness of the Exhibition, H.I. and R.H. the Archduchess Maria Theresa, then the Princess of Wales, H.I. and R.H. the Grand Duke Ferdinand of Tuscany, H.H. Prince Henry of Bourbon, Count of Bardi, among those who submitted themselves to the judgment of the jury. Prince Henry Liechstenstein, Count Wilezek, Count Charles Brandis, Charles Chotek, and others; further, three members of the Rothschild family, the Albert and Nathan (of Vienna), the Baroness Adolphe Rothschild (of Paris), Prince Antonio Ruffo, the Countess Loredana da Porto, and others. Numerous and distinguished are the names of those who have sent from afar, from France, America, Italy, Russia, and those from England so numerous that the Exhibition may almost be regarded as an English one.

The best landscapes have come from England, and it is the English amateurs in particular that have started the now fashionable school of impressionists who are most brilliantly represented at our exhibition. There are George Davison, of London; J. Gale, of London; Pattison Gibson, of Hexham; and Horsley Hinton, of London; Robinson, of Tunbridge Wells; Frederick Thurston, of Luton, &c., before all of whom we must reckon W. Clement Williams, of Halifax, with his sea-pictures. That which characterises them all is the picturesque reproduction of nature, which does not consist in their individual

* The word "impressionism," so much used in these days, literally means the reproduction of the impression made on the artist's eye. It may, however, have two meanings. Firstly, the common one, the one understood in artistic circles, namely, the dissolving and indefiniteness of the forms and tones, as, for example, a landscape appears to the eye with its foreground and background. Secondly, we may and must understand by it the impression which a landscape produces on the spectator's eye by virtue of its inherent character, and not by one put into it. The reproduction, or "stimmung," as it is generally called in German, also is "impressionism." That nature really possesses such feeling or "stimmung" is proved by photography, which reproduces it most expressively, for photography cannot first put it into nature, as certainly the artist can. In this latter sense it is used throughout this article.

choice and conception of the subject, but in the reproduction with the indistinctness of the human eye, in perspective with the fading and vanishing in the dim distance, with the impressions and humours which lowering or flying clouds, lights and shadows, sunshine and moonlight, morning and evening, mist or a clear sky, make on or produce in us.

It is astonishing with what perfection all this is shown by means of the simple gradation of the tones. A photograph as, *e.g.*, "A Misty Morning," by Thurston, is an admirable picture in itself, quite apart from its technique. Just so the wonderful blue sea pictures by Williams, with the hurrying storm-clouds and the light flashing on the water. There are three of them — "Sturmvolken" ("Storm Clouds"), "Mondnacht auf der See" ("Moonlight Night at Sea"), "In Stiller Nacht" ("The Dead of Night") —which are among the most beautiful things in the exhibition, and probably, too, the most beautiful that photography has yet achieved. Here, in one moment, photography seized and detailed all the details, but all the details—the moving waves, the flashing light—are so subordinated to the general effect that the whole makes an impression as though it were a perfect painting made with deliberate intention. In general, the sea seems to have become a favourite subject with the "impressionists" in England, even in its most agitated and disturbed moments. The rising tide, the water slowly and calmly ebbing from the strand, spray dashing against the rocks, waves rolling one over the other in the surf, all of them motions to be reproduced only by the instantaneous pictures, here they are represented true to nature and with artistic feeling. Other amateurs prefer taking the peaceful quiet of English landscape, the beautiful scenery of the parks, the trees hanging over the brooks, the cornfields on the undulating ground, the comfortable settlements by the wood, the whole charming sweetness of the English landscape, which, under the changing moods of the day, from dawn of day till dark of night, offers so much diversity. And all this usually takes place with characteristic natural figures not placed on purpose, so that here only instantaneous pictures were allowable. How beautiful in this respect is the picture by Thurston, "Changing Pastures," a flock of sheep coming towards us through a wood; or the two others, "Trespassers" and "Our Village." A masterpiece of another sort, by the same master, is "Frosted Trees," *i.e.*, a wood covered with hoar-frost.

In such pictures the English undeniably stand first, but in regard to sharpness many compete with them. Thus, there are altogether excellent strand pictures by Dreesen, of Flensburg, who understands how to represent ship-life in harbour, the sea itself in motion and like a mirror, together with all human scenery. But here the landscape passes over into the genre picture, and that is a second department in which these amateur photographers have earned laurels. There is much in the exhibition uniting landscape and figures, *e. g.*, country people in the fields, herds of cows, or flocks of sheep at pasture, village scenes, fishing scenes, groups of children lying down in the open air, scenes from military life, and many other things almost all demanding only instantaneous exposure, and just for that reason because only the fleeting, unconscious moment is fixed, they appeal to us with the truth of nature in contradistinction to a "posed" picture. Even this "posed" genre picture may have its charms under certain circumstances, as in the two Weidenhof Ninetta pictures, by Baron Adolphus Rothschild, which seem as though the idea were borrowed from Eugen Blaas' well-known pictures. From this point of view of designedness, or rather of avoiding design, genre photographers have had a more difficult task than landscape photographers, or those who have understood how to harmoniously unite landscape and figures. Certainly it is more difficult, in placing the figures, not to allow the intention to be noticed, and at the same time to preserve the naturalness of the motive or the group, and at the same time to give the picture the charm of right gradation, or the opposition of light and shade to make, as it were, a Dutch picture of common life out of photography not only of merely photographic value, but of purely artistic value. In this respect, mention must be made of all of the Countess Loredana da Porto's works. The jury did not do wrong in accepting from this lady alone eighteen photographs, all of the character of genre pictures.

But a yet more difficult task was that of the portrait takers. Here amateurs are in full competition with professionals, who, in this department, perhaps, achieve their best, but also in respect to the purely artistic side, sometimes their worst. Making the picture, or rather the portrait, a perfect likeness and a perfect photograph is the least part of the work that the professional does with ease and certainty. But here the photograph must be raised to a work of art, and the portrait to a painting; the original must be represented in the simple, grand style of the old masters, with the omission of all photographic prettiness. That has been attempted in different ways, and often accomplished, sometimes as a study, sometimes a real portrait. The portrait studies of Prince Antonio Ruffo charm us like portraits in Rembrandt's manner, like Ribera or Caravaggio.

Very beautiful, but somewhat in the far-fetched French manner, are the portraits and figure studies by Edgar de Saint Senoch, of Paris, but quite perfect as a picture and a man is the portrait of Professor Stuart Blackie by R. Faulkner, of London. To these we would add an exceedingly fine lad's portrait in profile by Mrs. Susan Hodgson, and the portrait of Arthur Chevalier de Bourchelt.

In truth we had many others to name, not only as portraits and figure studies, but also genre pictures and landscapes; nay, if we would be just, one would have to copy the whole catalogue, so good is everything the exhibition contains. It affords high enjoyment to the finest and most select taste, presenting a multitude of things interesting to him who is to some extent acquainted with the movement and progress of photography. In this last respect I would now point only to the diapositives, to the pictures in sunlight, and to those on rough water-colour paper, although the technical manner of the English impressionists is still unknown, or at least not clearly known to our photographers.

## CLAM-CHOWDER.*

BY W. WILLIS.

Clam-Chowder is an American dish for which Coney Island is very famous. It is now about ten years since it was my privilege to taste this delicacy, but unfortunately I have forgotten the exact formula. Suffice it to say that although the bivalve clam is the most important ingredient, yet there are many others, and fortunately so, for in this variety lies my safety. It ought to be already evident that "Chowder" is not my theme to-night, and if anyone

* A paper read before the Camera Club.

objects to what he thinks to be a deceptive title, let him visit at least a part of his spleen upon the head of our secretary, for it was in a fit of desperation caused by a telegram from him to "give title or life," that an evil spirit suggested "Clam-Chowder." I thought that under the cover of so multifarious a dish I could introduce anything which might suggest itself.

At a meeting of the Photographic Society of Great Britain, I made some remarks on developing baths for platinotype, and on the influence of temperature and dilution. These remarks form a fitting introduction to what I am to illustrate to-night. The printed scales referred to in that paper I now exhibit, but they are of very little help unless closely studied.

Now, I thought that by exhibiting a series of prints from ordinary negatives, the chief effects of certain variations in development might be readily displayed. I have here several distinct series of prints. Every print of a series is made from the same negative, printed on the same day with paper from the same batch, the difference between the prints being only in the matter of development.

The prints shown illustrate some of the variations to be obtained by cold development of hot-bath paper. The same temperature was used throughout the experiments—namely, 60 deg. Fahr.—and the developing baths were as follows:—

Normal oxalate solution, 1 lb. oxalate of potash dissolved in 54 oz. water.

Strong D solution (a mixture of potassic oxalate and phosphate), 1 lb. of the mixed salts dissolved in 54 oz. water.

Normal D solution, ½ lb. of the mixed salts dissolved in 50 oz. water.

The results obtained may be tabulated thus:—

| | |
|---|---|
| Normal oxalate at 60 deg. Fahr. | Gives a quicker development than either of the D solutions. And stronger middle tones. |
| Strong D solution at 60 deg. Fahr. Normal D solution at 60 deg. Fahr. | These baths give a slower development than the normal oxalate. And less strength in the middle tones. With the normal D solution the scale is slightly shortened. |

If these developers be acidified with oxalic acid the results are different, thus:—

| | |
|---|---|
| Normal oxalate acidified by $C_2H_2O_4$. Temp. 60 deg. Fahr. | Development much slower. The image weaker both in shadow and middle tones. |
| Strong D solution acidified by $C_2H_2O_4$. At 60 deg. Fahr. | The image very slightly weaker. |
| Normal D solution acidified by $C_2H_2O_4$. Temp. 60 deg. Fahr. | Shadows not reduced in strength, but the scale shortened. Hence a good developer for very weak and flat negatives. |

The principal difference between hot and cold development of hot-bath paper is seen in the middle tones of the picture. These middle tones in cold-bath developments are generally much reduced in strength. The other differences are slight, but the shadows are given with rather less vigour by the cold method. In length of scale the hot method has usually a little advantage.

If I am asked which of the developers referred to is the best for cold development, I think, upon the whole, one of the D solutions (but not acidified, unless for special effects). These solutions have less tendency to produce a granulated effect in the prints than a plain oxalate bath. In certain cases, however, especially in large work, granulation is decidedly advantageous in helping to give transparency, and therefore a plain oxalate bath would be more suitable.

In using cool baths it is necessary to print more deeply than for hot development, frequently until the deep shadows are solarised; and a much longer development is necessary. The progress of development should be watched and arrested at the right moment. As a general rule, paper which is two or three weeks old will give better results than fresh. And it is often useful to spread the prints at the bottom of a drawer or in a cupboard for a few hours before developing them. A caution against handling the sensitised surface is very necessary, for in cold development finger-marks and other injuries are very readily brought to light.

In working with baths at low temperatures a few degrees increase or decrease will make very distinct differences in the results obtained; much more marked than with baths at higher temperatures.

To-night I have illustrated only those variations due to a reduction of temperature, but many others may be made; for instance, dilution of the developer, introduction of restrainers, such as potassic chloride, &c.

At the meeting of the Photographic Society of Great Britain I showed some prints on wood, and yesterday I made a few more which I thought might be interesting. I will hand them round. Here is one more beautiful than any print on paper from the same negative; the transparency in the shadows is very wonderful. It was treated after it was dry with starch sizing, and afterwards with a little varnish. Here is a reminiscence of one of our excursions without any after-treatment. I don't really know how to treat the wood after printing. These are merely experiments, but I think wood might be made useful for decorative purposes, but proper subjects should be selected for the purpose; either plain dark or light backgrounds and simple subjects; copies of Japanese embroidery make very good pictures, which might be used for the panels of doors. There are certain difficulties in working with wood; it must be printed by the cold-bath process, as it is almost impossible to obtain first-rate results by the hot process. I should be very glad to receive hints as to the treatment of the wood afterwards. My best results have been obtained by the use of starch sizing and the rubbing in of a small quantity of boiled linseed oil. I have used American holly, which is very beautiful wood. Sycamore is no good for the purpose. Pine I have not tried. Most of the examples shown are on chestnut.

Discussion.

Mr. Maskell: I want to ask how long one may keep an oxalate bath (hot process), and what is the best practical method of restoring it to its normal condition. Is there any method of testing its specific gravity, for instance?

Mr. Willis: I think the bath may be kept for ever. The best method is to return the solution to a bottle after use, and replenish the bottle with fresh solution before using again. I never throw away a bath.

Mr. Davison: I have part of the same bath that I commenced with. When required, I simply put a few ounces of fresh solution to it before using it.

A Member: I would like to ask how long it is safe to keep the paper before using it?

Mr. Willis: I have seen excellent prints made on paper eighteen months old, and which had been round the world. I have seen paper two years old which was in very fair condition. I had some paper developed which was six years old, but the whites were degraded. I think you may say the life of the paper now is at least six months, and that it is as good then as on the day it is made. I am speaking of the A or thin paper. The B paper does not keep so long, but I have never used B paper sufficiently old to ascertain.

Rev. F. C. Lambert: Do your remarks apply to sepia paper?

Mr. Willis: I think sepia paper keeps if anything better than the other. I have seen some four or five months old in splendid condition; but it is a very uncertain paper. It is the most difficult to make, and the most delicate. I have never seen two batches alike yet; it always varies.

Mr. Maskell: I have found that with the extra rough surface paper I have had to print one tint deeper than with the C surface.

Rev. F. C. Lambert: It must require longer printing, because you get reflected light in the shadows.

Mr. Davison: That is so, and that is, perhaps, why it is suited to harsher negatives than the smooth paper. In my experience, sepia paper allows you to do almost what you like with it. I think it stands the damp very well. I have had prints left in the frame in the winter for three months, so that they have printed out, and I have got prints which satisfied me perfectly.

Mr. Willis: Taking the general experience, sepia is uncertain, and it certainly is so in the making. It varies in depth and colour, and is most difficult to control.

Mr. Davison: So much the better. We don't want our processes all cut and dried for us. I am sorry more is not made and used.

Mr. Willis: It is a very fine paper, and I hope some day to master these difficulties.

Rev. F. C. Lambert: You recommended the addition of oxalic acid to the bath for sepia paper; do you still do so?

Mr. Willis: Certainly. My experience recommends it, as does that of two or three of our most experienced workers.

Mr. Davison: Have you made any experiments as to the varying of colour more widely?

Mr. Willis: It is possible to get sepia very hot indeed, but it is then more difficult to manufacture, and requires greater care in handling. It is possible, in respect of colour, to obtain a range extending from blue-black to a hot sepia.

Mr. Davison: The effect of the special solution seems to be to cool the colour, and I do not think it improves it.

Mr. Willis: I much prefer the use of a very acid oxalate bath. I think this bath diluted with two parts of water, and used at 150 degrees Fahr., is very useful.

Mr. Davison: By variation of the treatment of the paper there is no doubt you can get a brown-black, or proper brown, or purple-brown, the latter by the addition of a suitable—that is, a very small—quantity of mercuric chloride.

Mr. Willis: Plain water will almost develop the sepia paper. You can develop it very cold, very hot, or very strong, and you can get corresponding variations in your print. To get the hottest tone the bath should be used at not less than 150 degrees Fahr., and acid.

Mr. Maskell: What is the effect of a considerable increase of the acid? I use two ounces. What would be the effect of doubling it?

Mr. Willis: I don't think you could double it; the binoxalate would be precipitated.

Rev. F. C. Lambert: Are we to have sepia in continuous rolls in time?

Mr. Willis: I hope so, if it can once be made by machinery. I think I can see my way to the machinery now, though I have tried several times and not succeeded.

Mr. Elder: The more I work at the paper the more interesting it becomes. There are so many conditions to be considered, and I have been playing with them a little lately. I have been considering what is the best course to pursue with a soot and whitewash negative, and I came to the conclusion, which Mr. Willis confirms, that the cold and perhaps diluted developer seems to give the best results. But there are so many problems I fear I shall never get a grasp of them all. I think I have learnt more from Mr. Willis's remarks than in the same space of time ever before on the subject. Mr. Willis, on the last occasion, referred to the great possibilities in regard to colour even with the ordinary paper. One does not want for ordinary work, as a rule, these rich, warm colours, but it seems to me that a great deal can be done by leaving the prints a longer or shorter time before developing on the hot bath, and even by damping them. I have damped them in the steam of the bath before developing them. Here are two prints, one of which was damped before developing, and its colour is decidedly warmer than the other.

Mr. Willis: The methods I have dealt with to-night are suited to what are called flat negatives. I intended to have said something about the method for use with very strong negatives. That is more a question of the manufacture of the paper than of anything else. Here is a print developed on a bath composed of 5 parts of oxalate solution, 1 part citric or oxalic acid, ¼ part of 20 per cent. solution of KCl. The print would have been absolutely black if developed in the ordinary way. It is extraordinary how you can make the tone warmer by keeping the print a few hours before development. Another method was to dilute the oxalate developer.

Mr. Elder: In the paper of eight or ten years ago, one wanted a negative of almost soot and whitewash character, but I now find great difficulty in getting a pleasing gradation with such a negative. In this print, however, a diluted bath and low temperature seems to have brought out almost enough detail in the hull of the vessel.

Mr. Davison: What do you say are the conditions in which the warmest sepia colours are obtained?

Mr. Willis: They would not be under the control of the printer.

Mr. Davison: The paper would have to be prepared for it?

Mr. Willis: Yes.

Mr. Lyonel Clark: I should like to have the point cleared up as to the best method of dealing with a hard negative. My own experience agrees with that of Mr. Elder, that a cold developer will give the longest range. My baths were used strongly alkaline, and not acid, like those of Mr. Willis. I used a strong developer at a low temperature. For weak negatives I should print lightly, and use a very hot bath.

Mr. Willis: If you want to make the best of a hard negative, don't use paper too fresh, and don't develop too soon after printing, but first put the print in a drawer for a few hours. One of the best ways to reduce the shadows is to make the bath slightly acid, and then add a little, but not too much, KCl.

Dr. Patterson: I have a sample of the paper showing, to some extent, its keeping qualities. It is the remains of a tube bought in November, and it has since been travelling across the Atlantic open. It was printed two weeks ago, and kept in a drawer for some time. It is not quite so sensitive as fresh paper, and it was quite wet when I picked it out.

Rev. F. C. Lambert: My experience of hard negatives is contrary to Mr. Elder's. The best results I obtained by printing rather deeply, using a saturated solution of oxalate of rather higher temperature than usual, and allowing the print to barely touch the surface of the liquid, and put into the acid bath immediately.

The Chairman: Mr. Willis suggested the dilution of the oxalate solution to me, and I tried some, one part of the solution to five parts of water, printing very deeply, and I got some very good results, but I found that the paper varied. Some batches produced very granular prints. Mr. Willis said the experiment was a very rash one, and he wondered that I got the results that I did. I gave up the experiment, and have gone in for the cold process. I should have brought some specimens had I known what the paper was to be about. I am sure platinotype workers will have been very interested, and that we shall accord a hearty vote of thanks to Mr. Willis for his paper.

A vote of thanks was carried by acclamation.

---

The article on page 444, by Herr von Falke, was kindly forwarded by the Vienna Club of Amateur Photographers.

## Notes.

Mrs. Drew, Mr. Gladstone's daughter, resents the idea that Mr. Hamilton's portrait of the veteran statesman in the Academy was painted from a photograph. The *Athenæum* ventured to say that "probably photographs were freely used." Mrs. Drew says the "portrait is entirely original, no photograph of Mr. Gladstone ever having been taken in that attitude." This may be; but it does not disperse the assumption that photographs may have been used. No painter would deliberately copy a photograph either in attitude or expression, but would not disdain to use a photograph for purposes of accuracy. We do not, of course, say this was the case with Mr. Hamilton's picture.

Photography can be tacked on to almost any trade or profession. The latest combination is that of photography and monumental masonry, and is mentioned by the *Undertakers' Journal.* It is obvious that the two go very well together. Most people, having fulfilled the last duty to their relatives and friends, like to have a photograph of the tombstone, and the monumental mason who can handle the camera reaps the benefit. This opens up a new channel of competition with the professional photographer, who is beginning really to be pressed hard on all sides.

One of the smaller City Company halls, the Coachmakers' Hall, in Noble Street, has been open to the public this week for the exhibition of competitive designs in carriage building. The designs are of no special interest to photographers, but we allude to the subject because of the collection of photographs which hang on the staircase walls. These photographs are perhaps over a hundred in number, and are partly copies of engravings and partly taken from the objects—vehicles of various kinds, ages, and nationalities—themselves. As exemplifying the history of coach building, the photographs are instructive and valuable, and for this reason it is a pity that nearly every one is in process of fading, beginning with the faint, sickly yellow which photographers know so well, and ending with the speckled blotches which denote the last stage of decay. What is to be seen at the Coachmakers' Hall is, we fear, to be found elsewhere. Unless steps are taken to have photographs printed by some permanent process, many pictures of real historical interest must be lost to the next generation. We are afraid that curators are not sufficiently alive to this fact.

Much speculation has been afloat as to why the thief who lately robbed some chambers in the Temple carried off a photograph of Mr. Justice Hawkins. It has been suggested that as the robbery was very slight, the discovery of the features of his lordship, who is rather a terror to evil-doers, effectually stopped the thief from proceeding further in his depredations. On the other hand, it may be that the burglar was an old offender, and carried off the photograph as a memento of his interviews with the learned judge at the Old Bailey. A third supposition is that thieves are developing a taste for photography, and, having begun with purloining the photographs of judges, will end by "taking" the detectives with secret cameras. It would be rather a serious thing if photographs of detectives were systematically distributed among the thieving fraternity.

Some of the principal free libraries are developing energies in directions other than books. The free library committee of Leeds, for instance, has determined to hold a photographic exhibition. There is no reason why this example should not be followed. Local photographic exhibitions would certainly not only spread a taste for the art, but encourage the modest amateur. There are hosts of photographers doing good work who would not mind contributing to a small exhibition, but who would hesitate before sending their pictures to exhibitions open to the world.

There is no department in the army which is not governed, to a more or less extent, by red tape. The latest example is in connection with photography. A short time ago an officer wished his company in the Wellington Barracks to be photographed. There was no difficulty in obtaining the permission of the commanding officer, but this permission was subject to the approval of the authorities at the War Office. The War Office, as most people who have had anything to do with it know, cannot transact the most trifling matter of business without voluminous correspondence, and it was only after about twenty letters, containing all kinds of official questions and answers thereto, had passed that the momentous matter was settled, and the consent of the War Office graciously granted.

The number of periodical photographic publications continues to increase. Scarcely a month passes but one is added to the list. The latest is called the *Paris Photographe*, published by the indefatigable M. Paul Nadar, who, not contented with his recent success in the invention of a magnesium flash-lamp, is now turning his attention to periodical literature. The *Paris Photographe* is in the nature of a review, and is spoken of in very high terms by the press.

What with the photographer and his instantaneous photographs, and what with the scientific critic, the painter just now has rather a hard time of it. According to the camera, the way in which most horses are drawn is altogether wrong. Mr. Hugh Miller, of the Geological Survey, has written an essay, in which we find that the painter's notion of rocks, hills, and mountains is nearly always wrong from the point of view of the geologist. Now comes Mr. A. C. Ranyard, of the Royal Astronomical Society, who falls foul of Mr. Eyre-Crowes' picture of "Jeremiah Horrocks Studying the Planet Venus." Mr. A. C. Ranyard asserts that the planet has been drawn too small, and that Mr. Crowes had no authority for the astronomical instrument he has placed in the observer's hands.

The latest piece of scientific criticism is that called forth by Mr. Fildes' picture of "The Doctor." The case has been diagnosed professionally, and it is settled to be of a nature which would require a 6-oz. bottle of diluted ammonia. Unfortunately, Mr. Fildes has drawn a 2-oz. bottle. It is, however, only fair to the painter to say that he was quite aware of the medical requirements, but that artistic necessity forced him to draw a bottle smaller than he would otherwise have done. All this, however, shows that the lot of the painter in these naturalistic days is not a happy one.

## THE FABRICATION OF PHOTOGRAPHERS' VARNISHES.

BY H. C. STANDAGE.

The rough-and-ready directions of empirical formulæ given in many text-books for varnishes, more often than not express only what the particular person giving such directions has found useful in his experience; but as each photographer has his own method of manipulation, &c., what one man finds suitable, a second cannot work with, to produce anything like favourable results.

This is the case with photographers' varnishes, the formulæ for which vie with developers in number. In these pages we purpose giving technical directions for the production of a perfect varnish.

The varnishes used by the photographer are mostly volatile, and partake more of the character of a lacquer than a varnish. By volatile, we understand all those from which the solvent can be evaporated by heat without suffering decomposition; they therefore include all those varnishes which are not prepared with fat oils.

Until very recently, the only solvents for the production of volatile varnish were spirits of wine, methylated spirits (a modification of alcohol), and oil or spirit of turpentine. Now, however, owing to the great progress made in the tar and petroleum industries, we have other excellent solvents, such as benzole and petroleum naphtha. The addition of these agents has altered the method of producing volatile varnishes, for now it is very often that the resin is dissolved to the consistency of syrup by one of these solvents, and then reduced to the proper consistency for use with spirit of wine or oil of turpentine. As alcohol (spirit of wine) that is below 90 per cent. contains water, and as water is very undesirable in all kinds of varnishes, to make a good varnish necessitates the use of absolute alcohol (*e.g.*, 90 per cent. strength); but this spirit is expensive. We have an excellent substitute for it as regards cheapness in the wood-spirit. For the varnish, when colour is a matter of indifference, methylated spirit answers every purpose. The quality of varnishes varies according to the various resins used, and also according to the nature of the solvent.

Pure spirit of wine varnishes can easily be obtained, of a colour as light as water, if they are prepared in the right manner. They dry very quickly, especially in summer, and produce a smooth, glossy coating which seems to be faultless. But even if the varnished object is protected from all shocks, it will be found, in a very short time, especially after a great change in the temperature, that the varnish has *innumerable fine cracks*, in consequence of which it *loses its lustre*, and even peels off if the layer of varnish has been somewhat thick. The cause of this phenomenon is found in the fact that the layer of varnish consists of nothing else but the unchanged resin, which lies upon the article in a thin layer. As resins are mostly very brittle bodies, a very inconsiderable lowering of the temperature suffices to occasion a separation of the contracting particles, whereby the above-mentioned cracks are formed.

This fault appertains to all volatile varnishes; in fact, the more volatile the solvent is, the quicker the hard coating will be formed, and the easier will it crack. This is very noticeable in those varnishes in the preparing of which ether alone has been used as a solvent. This fault, however, can be checked by dissolving, at the same time with the hard resins, also soft resins, which are nearly allied to the balsams or turpentines; or, not using spirit varnish by itself, but mixed with the oil of turpentine. Varnish—particularly a layer of a spirit varnish—consists, when dry, of a thin layer of resin only, the vehicle that kept the varnish fluid having flown away. When turpentine is used, there is always a small residuum of resin left by the latter spirit, and so such varnishes are not so brittle.

Oil of turpentine varnishes are prepared by dissolving the resins in oil of turpentine. When used by themselves, these varnishes produce as beautiful a coating as spirit varnish, and are also less brittle, because the residuum of turpentine that does not evaporate causes these varnishes to be longer in drying; but, in consequence, the particles of the coating find time to deposit themselves freely, and therefore the coating cracks or breaks less frequently.

Tar oil varnishes, as well as benzole and petroleum naphtha varnishes, possess nearly the same properties as spirit varnishes. The utmost precaution is absolutely necessary in regard to fire in preparing these varnishes, because these fluids evaporate very quickly at an extraordinarily low boiling point; consequently, the air becomes filled with this vapour, and directly this comes in contact with fire an explosion takes place. The safest plan to pursue with these volatile fluids is to add just as much resin as can be dissolved by a given quantity of fluid to form a viscid liquid, and to reduce this with spirit of wine, oil of turpentine, or almond, which shortens the labour considerably, as the resins are dissolved much more quickly in benzole and petroleum naphtha than in alcohol. As has been already mentioned, all alcohol used for dissolving resins must be *absolutely very strong*, and show at least 90 per cent., but a somewhat weaker spirit of wine (about 85 per cent.), or, under certain conditions, even only 80 per cent. strong, may be used for reducing a solution already made.

But it may be recommended in all cases to first determine by a preliminary test, with a small quantity of varnish, how far the use of weaker spirit of wine is advisable, because if it is too much diluted it has not the power of keeping all the resin in solution, and a part of the latter will separate in the form of flakes. When, in testing the varnish, it is observed that it becomes less transparent, especially when exposed to a lower temperature, or even commences to opalize, it is a certain proof that the spirit of wine has been diluted too much. Such spirit of wine varnishes as are required to dry very quickly must, of course, be prepared with spirit of wine containing as little water as possible; in fact, the strongest alcohol obtainable in commerce should be employed for such varnishes.

*Preparing Volatile Varnishes.*—Volatile varnishes on a small scale are easily made, as no particular or elaborate apparatus is necessary. Thus, all that is necessary is to put the resin and solvent into a vessel, and exclude the air. This rough-and-ready plan, however, can be vastly improved on by simple means, thus: break up the resin into pieces about the size of a pea, and tie it up loosely in a small linen bag, and fasten this to a hook fixed in the under side of a bottle cork, so that when the cork is put in the bottle, the volatile solvent just covers the top of the bag; room should be left for the resin to swell. A much better product will be obtained by this means than the former, because, in that case, the solvent can reach the surface only of the resin, and, as the dissolved portion is heavier than the spirit above, a dense layer of dissolved resin will be above the undissolved portion, and so prevent the fresh spirit from reaching the resin. It is for this reason that spirit varnishes require frequent shaking while being prepared. With the resin in the bag at top of the spirit, as it becomes dissolved the heavy mixture falls, and so the bag is continually in contact with fresh spirit.

When varnishes are used on the large scale, they often contain small particles which make them turbid; they therefore have to be clarified. This can only be done with volatile varnishes by allowing them to stand for weeks in large bottles in places where they are safe from all disturbance. The solid bodies will then gradually settle in the bottom, and the clear varnish can be poured off by careful handling. By this method a great number of expensive and easily broken bottles, as well as considerable space for storing them, render the clarification costly, and besides, a certain percentage of the varnish is lost by unavoidable evaporation of alcohol, by spilling, &c.; and, to obtain bright and light colour varnishes, they should be filtered.

*Filtration of Varnishes.*—Owing to the viscosity of varnishes, their filtration occupies considerable time, and, if filtered in uncovered vessels, quite a quantity of alcohol, benzole, &c., is lost by evaporation. Fig. 1 shows a simple yet efficacious apparatus, that is easily made at little cost, for the perfect filtration of small quantities of volatile varnishes, and without loss of spirit by evaporation.

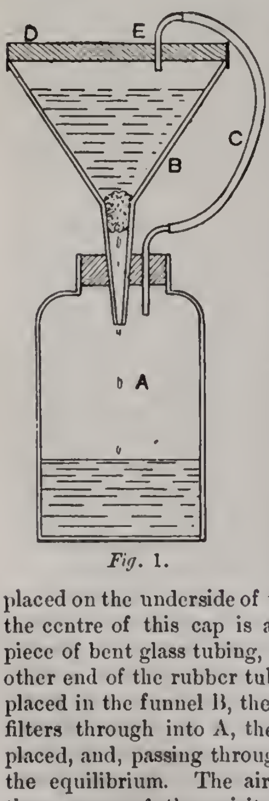


*Fig.* 1.

A is a large bottle, either of glass or tin. This is hermetically closed by a cork with two holes; a caoutchouc stopper is very handy in this case, or a wide bung. B is a glass funnel, the neck of which passes through one of the holes in the cork of A, while a piece of bent glass tubing, connected with a piece of india-rubber tubing, C, passes through the other hole; a plug of cotton-wool — medicated wool I find the best—is put in the neck of the funnel, or else a filter paper is used. I prefer the former for both spirit and volatile varnishes. The top of the funnel is ground smooth, and a piece of mahogany made to fit accurately thereon as a cap, D. A ring of rubber placed on the underside of this cap renders it air-tight. In the centre of this cap is a hole, through which passes a piece of bent glass tubing, E, which is connected with the other end of the rubber tubing, C. The volatile varnish is placed in the funnel B, the cap put on, and, as the varnish filters through into A, the air in the latter vessel is displaced, and, passing through C, enters E, and so keeps up the equilibrium. The air in B becomes saturated with the vapour of the spirit; but, as such vapour cannot escape when the air is saturated therewith, no more vapour is given off from the varnish; thus, the consistency of the filtered varnish is uniform, which is not the case when it is filtered in an open funnel, because, as the spirit evaporates, the proportion mixed with the resin is lessened, and so the latter portion of varnish that is filtered becomes thicker than the first, due to this loss of spirit. When the plug of cotton-wool or filter-paper ceases to act well —*i. e.*, when the varnish filters very slowly—whatever is in B should be poured off, and the filtering body be replaced with fresh material.

*The Decoloration of Varnishes.*—One great drawback to using varnishes is that they possess too much colour for the purpose to which they are required to be put. There are many means of bleaching varnishes and of bleaching the natural resins before use, but the safest and simplest material for general use is animal charcoal. To use this material, it is best employed in small pieces like coarse sand, because when powdered animal charcoal is used the pores soon choke up, and filtering becomes a very tedious operation. Before using the charcoal at all, it must be freed from the salts contained in it to render it suitable for our purpose. This is done by treating it with hydrochloric acid in the following manner. A quantity of raw animal charcoal is placed in a suitably sized stoneware jar with a lid to it, and a quantity of raw hydrochloric acid equal in weight to half or three-quarters of the weight of charcoal used is poured on it, and the whole allowed to stand for one day in the covered jar with frequent stirring. The contents of the jar are then poured into a tub containing about five times the amount of water that the jar would hold, the charcoal allowed to settle, the fluid poured off, and clean water poured over it. This operation is repeated until the water is entirely free from acidity (ascertained by means of a blue litmus paper not becoming red when dipped in it). The washed animal charcoal is then dried by heat.

For preparing small quantities of the varnish, the decolorizing can be done at the same time as the filtering by plunging the animal charcoal in the funnel B, and pouring the varnish to be filtered upon this. This method, however, has its disadvantages in respect to changing the filtering substance or the animal charcoal, if either one of these substances should lose its effect. Therefore it is best to carry on the filtering and decolorizing in separate vessels.

In fig. 2, the varnish that is to be decolorized and filtered is put into the bottle F, which has a stopcock, G, fitted to it near the bottom; this is connected with the bent pipe, H, by a bit of rubber tubing. This pipe dips just below the lid of the vessel P, and the neck of this vessel enters the cap D of vessel B, while the pipe E fits into a hole in the cork of F. This arrangement allows the varnish to flow into G to be decolorized, and from thence into B to be filtered, while the finished product is secured in the vessel A. The

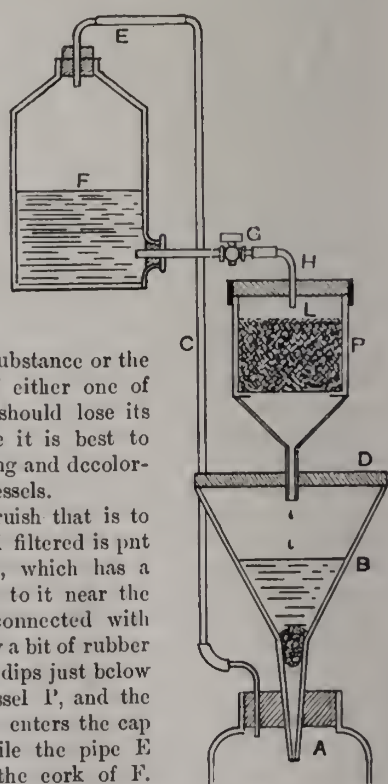


*Fig.* 2.

vessel P is of peculiar construction; it is a cylindrical vessel of sheet iron, with a ring in the bottom, which serves as a support for the cylinder, L. This cylinder is of woven wire, and is filled with coarse-grained animal charcoal. To use this apparatus, the stopcock G is opened, which allows the varnish in F to flow into P, where it is decolorized by the animal charcoal. From this it passes immediately into the filter, and the finished article is collected in A. The arrangement of the entire apparatus is such that, should it become necessary, the filtering material or the animal charcoal can be changed in a short time, and, at the same time, any loss by evaporation is prevented.

(*To be continued.*)

## RUSTIC LIFE STUDIES.*

BY J. J. THORNTON.

Much has been written by eminent writers on nearly every subject of photographic art, with the exception of the rustic life class; and I may, by way of preface, say that I am somewhat surprised that so few students in photography apply themselves to this class of work. But however my praises and enthusiasm of it may at first seem to denote that I have given exclusive attention to it, yet I am the last one to depreciate the other branches; there is plenty of scope in all classes, and all require *taste* and *skill*; but still I contend that the figure study class is one of the most difficult and highest forms of the art

It is sometimes contended that photography is merely a science and not an art, and in Bohemian circles the appellations would have been treated with derision; but this idea is both false and erroneous, and is gradually dying out, for the beauty and success of photographic specimens is due to the artist, and not to the apparatus and material which he has at his disposal. For instance, giving the same advantages to two operators, one may be found to have produced a decided failure, while the other, with the selfsame medium, will be able to show you a picture with true artistic feeling and admirable effect.

But to return to our subject, viz., figure study, which is already pronounced to be the most fascinating form of the art. To achieve success it requires to be studied intellectually, and closer observation is also necessary if the object in view is a true representation of a pleasing picture. It is not my intention to supply a form of practical rules, but merely give a few hints (from my own experience) to those who have not yet given any attention to this class of work. In the first place, if you have not naturally a taste for this subject, you should endeavour to acquire an interest yourselves in the fine arts; not only admire them, but study them minutely, for those who do not commence from the beginning will never derive the full benefit of the pleasure which this art affords to those who do. A thoroughly good camera, with all the latest ingenious improvements and eccentric movements, and a first-class lens with iris diaphragms, are no doubt of invaluable aid; but the secret of success is in the selection of your models and arrangement of them. In landscape photography, happy thoughts may be made almost anywhere. The old thatched cottage overgrown with moss, the winding brook, the glassy lake, the park, the woodland glade, and the shady pool reflecting the majestic trees—all these are subjects of captivating loveliness and picturesque beauty. But you cannot so easily pounce upon models for your figure study subject. Pictures depicting rustic life always afford much admiration and satisfaction on account of the peculiarities and oddities of their dress, and their careless and simple habits. For these you must visit villages, hamlets, farmhouses, and cottages; get on a friendly footing with the villagers, converse with them and study their customs, their manners, and their humours. The most retired neighbourhoods produce the best subjects. There are many quaint villages of this description in the neighbourhood of Southsea, and which are very little explored by the photographic artist, although, strange to say, you will frequently meet with artists with canvas and brush in these picturesque parts; and for old world customs and primitive simplicity, there is no place better to find your models. A very good study is that of a characteristic aged female (being, we are told, in her eightieth year) at her cottage door, whose face is rugged and marked with strong lines. In one of the rudest and poorest habitations we have a girl, slatternly and poorly clad, reclining idly against a water tub, with a listless indifference as to the present, past, and future, quite contented with her native place, and devoid of all curiosity. The boys of the village are generally to be seen paddling in the water, playing with boats, cutting sticks, throwing stones into the water, or very often engaged in a free hand-to-hand fight; always up to some kind of mischief, the younger girls and the smaller fry looking on with supreme delight. An infirm old woman has given her pail to one young rascal to fill for her with water, and on her requesting its return, he impudently looks up and asks her if "she will have it now, or wait till she gets it." Of course this is very tantalizing to her; but she can only retaliate by telling him that she will tell his mother, a threat which need hardly be said is treated by the young imp with laughter and derision. "Washing day" is a busy day in the village, when the "young ladies" are reluctantly compelled to assist their mothers, much to their disgust, when playing would have been more preferable.

Wending your way towards the beach, one of the best studies is the fishermen—strong, robust, healthy men, dressed in blue-coloured jerseys and huge leather sea-boots reaching up to the thighs, the soles studded with heavy iron nails, and oilskin sou'wester worn the front part to the back of the head. They are by no means lazy, for when not engaged in fishing, their time is occupied in mending their nets and repairing and painting their boats. At other times they may be seen lounging about the harbour, in parties of two or three, and each of them accompanied with his short pipe.

But the most charming model of all is the skipper's daughter, a most interesting and amiable child, bright, cheerful, animated, and the favourite of the village. Many of the villagers are, of course, in keeping with their homes and their manners, rather uncouth, but still a hearty welcome is ready to the visitor, provided that permission is in the first place obtained. You will find them very cleanly, and, judging from the freshness of their complexion, and the robustness of their figures, they may be deemed a very healthy lot of people. There is, therefore, nothing objectionable in mixing with them and encouraging them in their various occupations and enjoyments, for preliminary attentions and study must be given to them before attempting to realise them by photographic means. Having endeavoured to put models of various kinds before you,

* Abstracted from a paper read before the East Southsea Photographic Society.

the student must now rely for the success of his picture upon the pose and general composition, for it is there where your originality must be brought to bear. A larger aperture should be used than for landscape work, where definition of distance and surroundings is not so much an object, for when figures are your subject your background requires keeping back, and adds boldness and relief to your figures. Many pictures are spoilt through using too small a stop, thus bringing distance equally sharp with your subject, which frequently comes out weak, flat, and devoid of all contrast. Briefly referring to genre pictures, such as a reproduction of a group of children—whose object is to release the boat from its fixed position—is clearly shown in a picture. Many difficulties will have to be contended with, for as a rule each member tries to make himself more prominent than the rest by getting as near as possible to the centre of your instrument, and gaping into the lens with that pertinacious curiosity which is so irritating to the student, and so fatal to the ultimate result. His or her attentions must be at once directed to something else; give each of them something to think about, or something to do; humour or bribe them when necessary. Having then succeeded in getting them all pursuing their vocations in an easy, unconstrained manner, a quick exposure will do the rest. For pictures of this kind the best results are gained with a sharp shutter exposure on an extra rapid plate, when the movements are actually in motion. Single figure studies, although requiring greater care and attention in the arrangement and posing, are not so troublesome; still, on the other hand, greater care and attention must be observed, and the rules of art more strictly attended to; the surrounding must be in keeping with your subject. The dress of your model should be considered; one in light colour should be placed with dark accessories, and in like manner a figure in dark attire against a light background.

Presuming, therefore, that you have made a selection of your model, you should now focus carefully on some object in the position which your figure will occupy, so that you may avoid wearying or taking up their time in trying experiments upon them. Should you have a friend with you, make use of him for your preliminary arrangements. It is as well here as in groups to have your model in the act of some employment and perfectly natural, being careful at the same time to avoid all semblance of forced or artificial posing, otherwise you are not likely to get a pleasing and easy realistic picture. The exposure should be from two to three seconds, with an open aperture, and a slow plate is much more preferable for this work. The exposure, of course, depends a great deal upon the quality of the light, a subdued light being the best. On no account ever attempt to take a picture with sunlight striking on your sitter or figure. Of course these are merely hints and suggestions from the experience of one man only, but there is no system that is infallible, and it may be useful to know of one which has not altogether been an absolute failure. In cases of failure, which we all have at times, you must repeat the same subject again and again, provided it is one deserving of trouble. In conclusion, I should recommend you to study art if your aim is proficiency. The artist studies how he can get certain effects. Why should not you?

---

In a series of competitions to be held by the Newcastle-on-Tyne and Northern Counties Photographic Association, the class for the best six lantern slides will be open to the world, and two silver medals will be at the disposal of the judges.

## MAGIC LANTERN MISSION.

Mr. W. T. Stead has asked us to give publicity to his proposed scheme for a national society of lanternists. At the time when he first ventilated the subject, we expressed the conviction that lantern entertainments were already somewhat overdone, and that he had long ago been forestalled in many of his suggestions. We further expressed the opinion that it was far better to make use of existing agencies for the manufacture of lantern slides than to endeavour to create new sources of supply. There is something unseasonable in thinking of lantern matters in the month of June, but we comply with Mr. Stead's wish in reprinting the following article from his publication, *Help*:—

### Proposed National Society of Lanternists.

I wish to appeal this month to all who are interested in magic lantern work to send me their views as to whether, if a sufficient number of names could be got together of persons who volunteer to co-operate in carrying out the objects of the Magic Lantern Mission, it would be feasible to form a Lanternist Society, having its headquarters in London, with branches in all the more important districts throughout the United Kingdom, the special points to be kept in view being:—

(*a*) The combination and concentration of individual effort for promoting the education and recreation of the people by the aid of lantern services, lectures, and entertainments.

(*b*) The stimulation and cultivation of slide painting and reproduction as an art.

(*c*) The establishment of a system of exchange bureaus for the interchange and hiring of slides and the diffusion of lantern literature.

The lines upon which such a society should be formed are essentially those which permit of the closest co-operation between its members for the purpose of carrying on the mission. Unlike, therefore, most other societies of the kind, it would fall short of the attainment of its object if its members were dependent upon meetings held at lengthened intervals. On the contrary, its success will depend upon the personal co-operation of the members in their own particular district. Thus, in reality, such a society would consist of an amalgamation of "live" branches, each of which would form in itself an independent organisation. Meetings would be held in the large centres at regular intervals to consider the best means for carrying into effect the needs of the various branch missions embraced by the particular area.

*A Central Committee of Management.*—The management of the Society would be vested in a central committee, or council, having its headquarters, for convenience, in London. Such committee would be popularly elected from year to year, and would be empowered to deal with the subscriptions of members or other funds received for the benefit of the Society.

*Annual General Meeting.*—In order to maintain the working standard of the Society, and for the interchange of ideas for the widening of its basis, as also for the strengthening of the bond of good-fellowship which should bind the members together, it would be necessary to hold an annual general meeting of the Society at headquarters. To this annual conference of lantern mission workers it would be feasible, as well as advantageous, for the members to delegate one or more trustworthy and competent member of their body to represent their views and requirements. In this manner it would be secured that the uttermost extremities of the Society, to which circumstances of distance, &c., would present obstacles to personal attendance, would be adequately represented.

*Working Expenses.*—The working expenses of the Society would have to be arranged on a plan which would take special cognizance of the wants of a particular district. For many reasons it is obvious that a settled subscription should be paid by each member, and that the amount should be fixed at as low a figure as would be consistent with the due fulfilment of the Society's aims. Whatever sum may be agreed upon as adequate for sustaining the Society in efficieut working order, it is apparent that there are two ways of working it.

*The Local Branch to be Dependent.*— One of these is for the local branch to look for its working expenses to grants from the general fund, the amount of such grants to be determined and controlled by the governing body upon the representation of the needs of the particular district. With this plan there would be an equal subscription combined with a most unequal distribution of the fuuds, one district, as a matter of course, drawing more than another.

*Or Self-Supporting.* — The other plan, which would have many local advantages, is that each branch of the Society should be self-supporting. It should have the management and control of its own affairs, subject only to the rules of the Society, and its members, whilst paying a nominal subscription for meuibership to the Society, should regulate their owu expenditure by meaus of a committee appointed from their number, the necessary and special expeuditure to be incurred being met by subscription or funds raised in such ways as may be judged fit and proper. Thus, in an exceedingly poor and populous district, where the ueed for lanteru work would be very great, it would be open for the local committee to fix a charge for admission to entertainments, which would cover the cost of production in each case. The point in question, therefore, is whether the local brauch should be self-governed and self-supporting, or, on the other hand, controlled and governed by a central committee of management at headquarters.

*Qualifications for Membership as Lanternist.*—The qualifications for membership are twofold. It is a *sine quâ non* that a person seeking to enrol himself as a lanteruist should possess a lantern, or access to one. Experience, of eourse, is also necessary, and its amouut would be duly registered. All lanternist members, irrespective of the apparatus they possess, would enjoy equal privileges as members of the Society, but it would follow as a matter of course that the service which a member might be expected to render in his district would be largely determined by the nature and quality of his apparatus.

*As Lecturer.*—The second qualification for membership is the ability to lecture or talk upon certaiu subjects. In this class of membership, likewise, some experience is necessary, so that the lecturer may be presumed to be familiar with his subject. He may, of course, take several subjects, or may confine himself to one. Anyway, the subjects he specially favours would be registered. It will be seeu that a close and harmouious relationship is necessary between the lecturer and the lanternist in working the district placed under their charge, but it is quite open for a member to enrol himself as a lanternist and lecturer in one, if he prefers to do so.

*Associate Members.*—It is hardly necessary to point out iu how many different ways the objects of the mission may be furthered other thau by possessing a lantern or the ability for speaking or lecturing. They will readily suggest themselves to the minds of those who are in full accord with the plan sketched out in the initiatory article, which I published in the December number of the *Review of Reviews*. It would doubtless be possible to arrange for the inclusion of such proffers of service otherwise than by full membership, but for the latter it is necessary that the qualifications should be distiuctly stated.

*Lantern Endowments.*—It may be hoped, if the Society is successfully started, that a fund may come to be provided whereout lanterns and apparatus may be purchased and presented as a free gift to those districts most in need of them. In the meantime, it would be the duty of each lanternist member to do all in his power to secure that his district should be adequately supplied with a lantern outfit.

*Definition of Districts.*—Regarding the district, the working of which would be entrusted to one or more resident members of the Society, its definition should, I think, be based upon the unit of population. Thus, I would suggest that for every 10,000 population the Society should reckon upon one competent lanternist member, and one equally qualified talker or lecturer, who would be prepared to devote at least one evening per week to the purposes of the mission. The precise definition of such districts is a matter that might well be left to the consideration and convenieuce of the local committees.

*Special Features of the Society.*—The special features which should pertaiu to the central committee of management are essentially these :—

(*a*) That there should be a classified list of all the slide sets issued for sale or hire, with the lowest prices at which they can be procured for mission work.
(*b*) That there should be a directory of all competent slide-makers, with the terms at which they will work, and particulars of their productions.
(*c*) That there should be a directory of all lantern makers and appliances, with the prices at which their productions can be bought or hired.
(*d*) That there should be a list of all professional lanternists and lecturers throughout the United Kingdom, with statement of their terms, and particulars as to the nature and subject of their entertainments.
(*e*) That there should be published monthly an official organ of the Society, which shall contain an account of the progress of the Society, together with reports furnished from time to time by the local committees to the central committee of management.

Those in sympathy with the idea of the Mission, and who desire to help in carrying out its aims and objects, are requested to fill in and return to Mr. Stead, at Mowbray House, Temple, W.C., on a form of enrolment, particulars of the service they are prepared to render, adding thereto any suggestions which may strike them as being likely to further the object in view.

## ROYAL OBSERVATORY, GREENWICH.

We are favoured with a copy of the report of the Astrouomer-Royal to the Board of Visitors, read at the annual visitation of the Royal Observatory, June 6th. The report refers to the year from May 11th, 1890, to May 10th, 1891, and exhibits the state of the Observatory on the last-named day ; and from it we present extracts that are of more especial photographic interest.

Under the head of "Buildiugs and Grounds, Movable Property, and Library," are included a computing room for the new astro-photographic branch ; fireproof rooms for the photographic records and books of calculations in these two branches ; a library for the physical branch (magnetical and meteorological, spectroscopic and photographic) ; and a laboratory and dark galleries for spectroscopy and photography. Among the principal movable instruments are mentioned photo-heliographs (at Greenwich) :—One complete (No. 4, mounted iu the South Ground), two tubes (E2, A5, with object glasses), and a driving clock (used for the personal equation instrument), and a complete mounting, with driving clock (No. 3), used last in the Cape Ledo Eclipse Expedition. Photo-heliographs on loan :—One complete at the Cape Observatory, one complete and the mounting of another (without driving clock), lent to the Science and Art Department.

A photographic telescope, with 9-iuch object glass, by Grubb, and a prism of 9 inches diameter, by Hilger, have been generously presented to the Royal Observatory by Sir Henry Thompson. The telescope has been mounted on the Lassell telescope as a photo-heliograph, to give 8-inch pictures of the sun, a camera with Dallmeyer doublet (from photo-heliograph No. 4) and an exposing shutter, specially designed to give very short exposures, being attached to it.

In view of the advantage resulting from the use of electric lighting for the photographic equatorial and for other instruments, it is very desirable that an electric light installation should be provided for the Observatory, so that this method of lighting, which is specially adapted to the requirements of au observatory, may be applied to the instruments generally. The system now in use of charging storage cells from primary batteries is necessarily extravagant, and it does uot admit of the desired extension.

Under the head of "Astronomical Observations," we learn that the photographic equatorial has been brought into working order after some delay, occasioued by the necessity for workin_ out details of plate-holders, réseau-frame, and other accessories after the instrument was set up. Unfortunately, when it was otherwise ready for use, the ratchet to the weight barrel of the driving clock—which was of the sileut form—gave way on October 27th, 1890, letting the heavy weight fall. The barrel was sent to Sir H. Grubb, who applied an ordinary ratchet to it, with a new steel piuion, and returned it on November 24th, 1890. The instrument has since worked very satisfactorily, and is admirably adapted to its purpose, the electrically controlled clockwork in particular being very efficient.

Work with the 13-inch photographic refractor was seriously delayed by this accident to the driving clock, and later by the illuess of Mr. Criswick; but 81 stellar photographs have beeu taken, all of which must be regarded as more or less experimental. Ferrous oxalate development was used throughout, and all the plates were photographically impressed with the réseau kindly supplied by Prof. Vogel. The exposures have varied from a few seconds to about an hour; and trails have beeu taken both ou the equator and near the pole to test the adjustment for orientation. Several different kiuds of plates have been used, includiug Cramer, Seed, Paget, Star, Mawson and Swan, and Ilford, and, on the whole, the choice seems to lie between the Star and the Ilford plates.

Some trial photographs of Polaris have beeu taken with the Dallmeyer 4-inch photo-heliograph object glass, which it is proposed to use as an auxiliary telescope to test the quality of the night by short exposures ou Polaris during the exposures for the chart plates.

*Spectroscopic and Photographic Observations.*—For determiuatiou of motions of approach or recession of stars, 286 measures have been made of the displacement of the F line in the spectra of 31 stars, and 14 of the *b* line in the spectra of 6 stars, besides comparisons with the spectra of Mars, the moon, the sun, or the sky as a check ou the general accuracy of the results. The series of observations with the $12\frac{3}{4}$-iuch refractor is now practically completed, and the results are under discussion. An examination of those for the 21 stars most frequently observed shows that there is a systematic error depending ou the hour angle, thus uecessitating a correction for the position of the spectroscope at the observation.

In the year ending May 10th, 1891, photographs of the sun have beeu takeu at Greenwich on 224 days, and, of these, 483 have been selected for preservation, besides 18 photographs with double images of the sun for determination of zero of position. For the year 1890, Greenwich photographs have been measured on 209 days, and photographs from India and Mauritius filling up the gaps iu the series on 152 days, making a total of 361 out of 365 on which photographs have been measured in this year.

The sun has been free from spots on 175 days in the year 1890, as compared with 211 days in 1889. There were only three spotless periods of more than 14 days in 1890, viz., February 2nd to 27th, March 24th to April 9th, aud June 11th to July 3rd, while iu 1889 there were nine such periods. The mean daily spotted area has increased from 78-millionths of the sun's visible hemisphere in 1889 to 100 in 1890. The measures of the photographs and the reductions of areas and positions of spots and faculæ are complete to the end of 1890. Photographs from India and Mauritius have been received from the Solar Physics Committee as far as February 4th and January 23rd, 1891, respectively.

As regards the further discussion of the results of former years, 46 Melbourne photographs, available for filling up gaps in the series in the year 1877, have been measured, aud these, together with those for the years 1875 and 1876 referred to in the last report, have been completely reduced, the orientation of the wires having been inferred by comparison with measures of Greenwich aud Harvard College photographs on neighbouring days, as no satisfactory details of this adjustment could be furnished from Melbourne. The copy for press, both of the daily results and the ledgers of sun-spots, is completed for these years. Ledgers of the positions and areas of spots for the years 1882 and 1883 are completed and ready for press, and those for 1884 and 1885 are being formed. When this is done, the reductions for the whole series of years from 1875 to the present time will be complete, those of the Indian photographs for the years 1879 to 1881 having been completed at South Kensington uuder the supervision of the Solar Physics Committee.

*Magnetic Observations.*—The photographic record of the three magnetic elements, and the supplemeutary eye observations, have been continued as before. The temperature of the basement in which the photographic instruments are installed has been maintained at about 67° throughout the year, except iu December and part of January, when the gas supply again became deficient, aud the ground iu the park was again opened to clean the pipes, which were found to be so much corroded that it will be necessary to renew them. They have been in use as gas-pipes for forty years, and had previously served as water-pipes before the existing water main was laid down.

The magnetic reductions are completed to the followiug stages:—The eye observations of the upper declination magnet, and of the horizontal and vertical force magnets, are completely reduced to the end of 1890. The time-scales for declination, horizontal force, and vertical force are complete to the end of 1890, and the base line values, deduced from eye observations, are entered on the photographic sheets for declination and for horizontal and vertical force. The hourly ordinates of the photographic curves are read out to the end of 1890 for all three elements, and the daily and hourly means are all taken; the time-scales for earth currents are laid down. The dip observations are completely reduced to the present time, and the deflexion observations for absolute measure of horizontal force to the end of 1890. The temperature of the magnet basement at every hour has been read off from the sheets of the Richard thermograph to the end of 1890, and the daily and hourly means have been taken.

The meteorological reductions are in the following state:—The observations of barometer, thermometers, anemometers, rain gauges, and sunshine recorder (corrected, where necessary, for instrumental error) are reduced up to the present time. On the photographic sheets all the time-scales are laid down, aud the hourly ordinates are read out for the dry and wet bulb thermometers and electrometer to the end of 1890, and some work has been done in taking means.

*General Remarks.*—The preparatory work for the photographic map of the heavens has occupied a good deal of attention during the past year, a number of new questions being raised in this application of photography to systematic astronomical work which have necessarily required careful consideration on the part of the chief assistant and myself. Under these circumstances the want of increased supervising power for the Observatory has been severely felt, and this want has not been iu any way met by the appointment, after a long delay, of an additional second-class assistant. The recent meeting at Paris of the International Committee for the photographic map, in which I took part, settled the bases of the work in a geueral way; but for working out the details, both practical and theoretical, much remains to be done, and, under the existing conditions of the Observatory staff, it is difficult for the chief assistant and myself to supervise this adequately, and to deal effectually with the important points of principle involved in the discussion of the excellent photographs which have been obtained by Mr. Criswick and his assistants.

---

Halifax Camera Club.—At a meeting held on Monday last, it was unanimously resolved to form a photographic club for Halifax and neighbourhood, and to make an effort to obtain suitable premises and have them thoroughly fitted up as a first-rate studio, embracing not only studio proper, dark room, enlarging room, and dressing room, but also a large room for meetings and lantern entertainments, and a reading room provided with the current photographic literature. During the evening no less than £20 was promised towards a furnishing fund in addition to subscriptions. The annual subscription was fixed at 10s., and the Club is to be open to both sexes, and to professiouals and amateurs. At the close of the meeting the names of forty-two persons were taken down as members. The honorary secretary, *pro. tem.*, is Mr. E. Finlinson, Union Bank, Halifax, from whom full information may be obtained.

# Patent Intelligence.

### Applications for Letters Patent.

9,844. Albert Aron, 23, Southampton Buildings, London, "Improvements in Glazed Screens for Photographic and other Pictures." (Adolphe Aron, France.)—June 10th.

9,906. Frederick Dresser, 20, Bixteth Street, Liverpool, "Improved Adjustable Photographic Printing Frame."—June 11.

9,971. Abraham Dirk Loman, 186, Fleet Street, London, "Improvements in or Pertaining to Portable Photographic Cameras."—June 12th.

9,984. James Gray, 4, York Street, Newcastle-on-Tyne, "A New Permanent Photographic Printing Process."—June 12th.

9,985. Charles Haseler and Charles Eustace Haseler, 12, Cherry Street, Birmingham, "Improvement in Cameras."—June 12th.

9,993. Edward Thomas Hughes, 38, Chancery Lane, London, "An Improved Pencil for Retouching Photographic Negatives, Bromide Prints, and the like, applicable also for Ordinary Drawing Purposes." (Edmund George Kerby, South Africa.)—June 12th.

### Specifications Published.

669. *January* 14*th*, 1890.—"Actinometers." E. G. Ballard, 1, Eversley Park, Chester.

An instrument for ascertaining requisite time of exposure in photography, applicable also in other cases where the relative intensity of actinic rays is to be ascertained. A tube blackened internally is provided with an eyepiece and a hinged cap, in which are inserted a disc of ground glass, a disc of plain glass covered with an opaque annular layer of luminous paint, or the like, the central space being left transparent, a piece of blue glass, and a piece of ground or plain glass. The piece of blue glass cuts off all the rays entering the tube except the actinic rays corresponding to those emitted by the luminous paint; it is wrapt in a number of layers of translucent material, such as tissue paper, which lessens the intensity of the rays passing into the apparatus, the degree of obscurity being constant for each type of photographic plate. The cap is turned to expose the luminous paint; when this is fully excited the eye is placed against the eyepiece, the instrument directed towards the object to be photographed, and the hinged cap quickly closed. There will then be visible a blue luminous band surrounding a darker spot. The time taken by the band to assume the same tone as the spot is noted, and from this, by reference to a suitably prepared table, the requisite time of exposure may be determined.

765. *January* 15*th*, 1890. — "Change-box combined with Camera." N. Browne, 73, Cheapside, London. (F. A. Fichtner, Elisenstrasse 6, Dresden, Altstadt, Saxony.)

The sensitive plates are contained in two compartments formed by a transverse partition. The plates are fitted in sheaths or carriers. After exposure, the plates are transferred from one compartment to the other by spring hooks on the ends of racks, which gear with toothed pinions on the axis, which is actuated by a crank outside the box. A fresh plate is thus introduced at the back of one compartment every time an exposed plate is removed from the front. Both compartments are thus always full, except in so far as space is always left to introduce another plate. Suitable springs are fitted in the spaces left to press the plates together.

---

Messrs. Taylor, Taylor, and Hobson forward a sample of a new level for cameras. One of these, used on the side of a camera swing-back, will insure the avoidance of the vertical distortion which is so often noticeable in photographs of buildings, &c. Another on the back of the camera frame will insure its true horizontal position. The firm's circular spirit-levels and T levels, which serve the two purposes at once, must be placed on the top of the camera, and as this position is inconvenient in the case of cameras on high tripods, they have designed the new level to be placed low down on the side and back of the camera, where it is more accessible.

# Correspondence.

### THE PHOTOGRAPHIC CONVENTION AT BATH.

Sir,—Will you kindly allow me to draw the attention of your readers to the forthcoming meeting of the Photographic Convention at Bath?

In the first place, I would point out to those who are not already members, that the Convention has amongst its adherents a very large proportion of the best-known amateur and professional photographers in the kingdom, and affords the best existing means of bringing together photographers from all parts of the country, and thus enabling them to meet their fellow-workers in the art, and discuss with them its later developments and the means of promoting their common interests.

The president at the Bath meeting will be Mr. William Bedford, whose name and work are familiar to every photographer, and his well-known tact and skill in the conduct of affairs are a guarantee that the control of the arrangements, and the guidance of the discussions which it is hoped will follow the papers, will be in safe hands.

With the help of our friends at Bath, we have been able to arrange a programme which, both from the point of view of excursions and papers, will compare favourably with that of previous years.

The railway companies will not give special terms to members on their journey from their homes to Bath, but members from a distance are recommended to avail themselves, as far as possible, of the ordinary tourist tickets. We shall, however, have considerable facilities for making excursions from Bath, either singly or in parties. During the week of the meeting, the Great Western, the Midland, and the Somerset and Dorset Railway Companies, will issue to any member, on production of his *signed* ticket of membership at the booking office at Bath, return tickets at a single fare to any station on their respective lines not more than fifty miles distant.

The excursions are of special interest, and, as already announced, include Chepstow and Tintern, Glastonbury and Wells, Salisbury, Corsham and Lacock Abbey, Bristol and Clifton. In addition, the local committee has obtained permission for members to photograph in the churches and other places of interest in and about Bath.

The papers are fewer in number than in previous years, with a view to prevent hurry, and to give time for discussion, which hitherto has often been cut short in order to make way for the following papers. The paper by Mr. W. Lang on "The Photographic Work of Herschel and Fox Talbot," and that by Mr. Common on "Recent Work in Astronomical Photography," are especially appropriate at a meeting in a district that is so intimately associated with the names of Fox Talbot and of Herschel.

One very important feature of the meeting will be the final report of our Lens Standards Committee, and the discussion thereon; and the discussion on "International Standards" that Mr. Warnerke has promised to open. It is hoped that everyone interested in this important question of standards will take part in the discussion, and that we may afterwards be able to appoint a committee to draw up a report or series of recommendations for presentation at the forthcoming International Congress in Brussels.

The Convention group will be taken on the Wednesday, and the dinner, which has always been such a great success, will, as usual, take place on the Friday evening.

In order that members may know where they are most likely to meet their friends, two hotels, the "Castle," in Northgate Street, and the "Royal," near the Great Western Station, have been appointed headquarters.

An exhibition of lantern slides will form one of the features of the opening meeting, and it is particularly requested that members who have slides of places visited at the last Convention, whether actually taken during the Convention meeting or not, will send them to me at the Yorkshire College, Leeds, or to Mr. W. Bedford, 326, Camden Road, N., at least a week before the opening meeting. Slides of other subjects will also be acceptable for exhibition either on that evening or at the other evening meetings.

The annual subscription is only 5s. Tickets of membership are now ready, and can be obtained from the Hon. General Secretary, Mr. J. J. Briginshaw, 128, Southwark Street, S.E., or from the Hon. Local Secretary, Mr. E. J. Appleby, 8, Argyle Street, Bath. C. H. Bothamley, *President.*

*Yorkshire College, Leeds, June 15th.*

## Proceedings of Societies.

### Holborn Camera Club.

A meeting on Friday last, Mr. D. R. Lowe in the chair, was held to elect a secretary in the place of Mr. J. E. Smith, who had resigned. Mr. Frederick J. Cobb, of 25, South Lambeth Road, S.W., was elected to fill the post, and Mr. A. Plumbridge was elected a member of the committee in the place of Mr. Cobb.

The prize given by Mr. T. O. Dear for the best picture taken at the Pinner outing last month, was awarded to Mr. A. J. Golding, who sent in a pretty picture of an old cottage.

Mr. A. Bell announced that he would give a prize for the best picture taken at the Purfleet outing, and the Chairman said he would also give one for the best picture taken at the London Colney outing on the 28th inst.

Twenty-one members, including five ladies, journeyed down to Purfleet on Saturday last, and spent an enjoyable day there. The members divided the plates in their slides between the annual fair, botany, and the river, taking shots at some of the vessels outward bound.

### Hackney Photographic Society.

A meeting was held on Thursday last, Mr. J. A. Sinclair in the chair. Mr. J. O. Grant presented the Society with twelve books.

Mr. Funston asked what strength should a hypo solution be used.

Mr. Hubert said twenty per cent. for prints, but rather liked a strong bath, though it bleached.

Mr. Beckett advised putting a little gold in the fixing bath for weak prints.

The Chairman liked the alpha combined bath, as it seemed to bring out density.

Messrs. Gosling and Roder showed negatives taken of the sun and the eclipse.

The subject of hand-cameras and plates therefor was considered, the several speakers advocating their special preferences.

Mr. Herbert Smith then gave a paper on "Photography and Cycling." The machine he preferred and used was fitted with the pneumatic tyre, as preventive of vibration. He carried his camera and sundries in a suspended arrangement in front of the steering bar. The only disadvantage he suffered from was dust.

Mr. Hubert thought glycerine would overcome the difficulty.

The Chairman observed that there would be a danger of dampness.

### Sydenham Camera Club.

The first excursion was made on June 6th, when a good muster of the members met at London Bridge Station, whence they journeyed by train. At Waddon, Mr. George Austin took the party through some charming scenery, and many successful exposures were made. On arrival at the "Greyhound," Carshalton, the few remaining plates were exposed on the church, pond, and main street of the village.

On the following Tuesday evening a meeting was held at the headquarters of the Club, the President in the chair. The discussion was upon the work done during Saturday's excursion. Some very good prints were shown by Mr. Zimmer, amongst them a group of the whole party. Mr. G. Austin's hand-camera subjects caused some amusement, he having caught several members unawares. Mr. P. Barlow showed some excellent work in Obernetter. A large number of prints and negatives were passed round and criticised.

Photographic Club.—Subject for June 24th, "Actinometry," to be followed by a series of lantern slides of Hildesheim by Mr. Frank Haes; July 1st, "Sensitometry." Saturday outing, June 20th, Chesham; train from Baker Street, 2.26.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

L. E. (Stockport).—*Back Numbers.* Whether bound or not, the Photographic Society might be glad to have them to complete their duplicate sets, for, at the present time, we know that there are a few gaps, and some of the Exhibition catalogues are especially wanted. Write to the assistant secretary, at 50, Great Russell Street, Bloomsbury, W.C.

J. McGeorge.—*Silver Printing Bath for Hot Weather.* Loaf sugar or nitrate of soda may be added to the bath in the proportion of five to ten grains per ounce, the object being to prevent the sensitised paper becoming too dry or horny by introduction of a hygroscopic substance. We do not recommend the addition of nitrate of lead at this season, for it would have the opposite effect.

Enquirer.—*Automatic Photography.* A tolerably extensive installation of these machines can now be seen in the grounds of the Royal Naval Exhibition, Chelsea, where, on sunny days, they are being widely patronised. The instruments require a little coaxing at times, and an attendant keeps up the supplies of the various chemicals. The aspect is nicely managed by having the machines grouped at different angles, but the public is not very discriminating, and often as not the customer poses in front of a lens into which is pouring a full blaze of sunshine! "Drop a penny into the slot," and you will hear a bell ring to announce the completion of the exposure; wait five minutes, and you will get a glass positive, dripping wet, but backed with a piece of ferrotype plate. A penny more buys a gilt frame, supplied mechanically.

Barnet.—*The Affiliation Scheme.* A few minor details remain to be settled, but the general scheme has been approved by the Parent Society, and circulars will shortly be sent out, inviting support and asking for the names of two delegates.

P. A. B.—*Enamel Paper.* Precipitated sulphate of baryta made into a cream with albumen or warm gelatine is applied to the surface of the paper, upon which the collodio-chloride emulsion is then poured. It would certainly be advisable to coagulate the albumen by heat before proceeding to sensitise its surface.

M. B. (Cambs).—*Quadrant Hand-Camera.* The ordinary size accommodates one dozen quarter-plates, and then weighs six pounds. The camera could be made larger; we have seen one specially made to order for 5 by 4 plates, but Messrs. Humphries and Co. inform us that they are not usually kept in stock of this size.

W. Manning.—*Seconds Pendulum.* At Greenwich the length of a pendulum beating seconds is 39·14 inches (one French metre), which practically holds good for any part of Great Britain at ordinary levels.

C. H. D. (Shrewsbury).—*Ballard's Actinometer.* The instrument does not appear to be known in this country, but, taking into account the fact of the description coming to us from an American source—*Anthony's Bulletin*—it seems likely that Messrs. E. & H. T. Anthony, of 591, Broadway, New York, would be able to supply it; or possibly the Eastman Company, 115, Oxford Street, W., might be willing to help you.

T. B.—*Permanence of Primuline.* During the fine weather of last week we made several rigorous tests by exposing to sunlight the red and purple developed images in primuline, and found the *former* to be more permanent. Light shades of purple on paper certainly fade to some extent, but the action seems to be arrested after a time, so that it was found impossible to obliterate even faintly printed impressions. The red pictures withstood the test fairly well, although we cannot even say of these that they are absolutely permanent.

J. E. D.—Answered by post, and the foreign letter returned.

THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1712.—*June* 26, 1891.

CONTENTS.



## PHOTOGRAPHING INTERIORS.

If dry plates have made the general work of the photographer less irksome than it was when he had the anxieties of a silver bath to cope with, they have certainly brought with them and rendered possible tasks which the men of twenty years ago seldom thought of attempting. To those outside the world of photography, everything that is visible must be capable of being photographed, and some will gravely argue that, because an express train travelling at sixty miles an hour can be made to give its swiftly passing image to the gelatine plate, therefore all things are possible by photography. A list of the impossibilities which some of these patient workers have been asked to perform would be amusing to read as a good example of human credulity. But, although it may seem impolitic to explain to the ignorant why particular subjects are unsuited to the camera, and can, if attempted, never give satisfactory pictures, it is better to do so candidly than to risk one's reputation in sending out a photograph which is a failure.

Among the chief subjects, apart from portraiture, with which the photographer is called upon to deal, are pictures of interiors. These embrace not only public rooms and churches, but also private mansions, and one or two of our foremost photographers appear to have laid themselves out for this particular class of work. They have made an earnest study of it, and, as they do the work well, they obtain plenty of patrons. There is a wide field open for this phase of photography, and those who have not yet turned their attention to it, and still keep to their old groove of portraiture, would do well to consider whether it would not be worth their while to encourage such a profitable branch of business.

Twenty years ago no one would have dreamt of recommending photographers to take up interior work as a profitable thing, and for two very good reasons: the first, that the old wet-plate process was unsuited to the work, unless careful precautions were taken to keep the film moist; and the second, that, so far as domestic interiors are concerned, there was little that was worthy of being photographed. We, of course, had our palaces and show places at that date, but the average rich man had not begun to think it necessary to spend, as many do now, a small fortune on the interior decoration of their dwellings. In many of the West-end squares of London, the exterior aspect of the houses is precisely the same as it was fifty years ago. The fronts of the mansions receive their annual or triennial coat of sober cream colour, and year by year they preserve their stolid appearance of comfort, cleanliness, and intense respectability; but if we step inside, we find what a change this half-century has brought about. The dining room, for instance, has no longer its walls flatted with a coat of green or drab, upon which the oil pictures, hung in massive frames, looked so well, but is now ablaze with the carefully chosen tints worked out by the ancient or modern tapestry weaver, while the lower portion is filled in with the inevitable dado made of inlaid woods. The spotless white-washed ceiling which contented our forefathers has gone, and its site is now panelled in polished woods. The floor is similarly ornamented in beautiful parquetry, and, instead of being hidden from wainscot to wainscot by a Brussels carpet, has a large square of "Turkey" or "Axminster" in its centre. The furniture has undergone the same transforming process, while the whole is brightened up with stained glass in the windows, and with rare flowers and handsome ornaments *ad libitum.* The room, and indeed every room of the house, is itself a picture, and small wonder is it that its proud possessor should desire to have it photographed.

Now, a photograph of such a room as we have described is not generally a difficult operation; but it requires great care if we desire to secure a first-class negative. The best lens to employ is a rectilinear, which may be replaced with advantage by a wide-angle of the portable symmetrical type if space be limited, as it very often is. Windows must be excluded from the picture if possible, and those which are outside its limits must be made to yield all the light available by either removing or tying back temporarily the window curtains. A time of day should be chosen when actual sunlight cannot enter the room, for a patch of bright light falling in one particular place is sure to make an unpleasant flaw in the picture. In London, and other places where the houses are near together, it is generally necessary to give an exposure of nearly half-an-hour; but, of course, exceptional circumstances may modify this to a considerable extent.

Not long ago we were shown two photographs of the interior of a church which were as perfect as could be wished. Such photographs are too often of the "chalk and soot" variety—the soot being represented in the black roof and pews, and the chalk by the windows, which usually spreads its whiteness by halation far beyond the limits of the window frame. These particular photographs were simply perfect. There was not only no halation from the east end window, but every detail in the stained glass pictures could be made out. More than this, the frescoes painted at each side of the window on the church wall were also rich in detail. How was this fine result achieved? was our enquiry. Were the plates backed, or were films used? The photographer used ordinary plates, unprepared in any way, and his success was mainly due to the simple expedient of having the east window of the church covered during the major part of the exposure. This is how it was done. The camera was carefully laid in position and focussed, a plate inserted, and an exposure of ten seconds given, after which the lens was capped. The window was now covered up, outside the building, with a baize carpet, reared on two uprights and a cross-piece, the arrangement being easily handled by a couple of men. The photographer now uncapped his lens once more, and gave an exposure of ten minutes. At the end of this time he put a fresh plate in the camera, and once more gave an exposure of ten minutes, and again capped the lens. It now only remained to take away the screen from the window, and to give a supplemental exposure of ten *seconds*, and two well-exposed and perfect negatives were the ultimate result. The same artifice can be adopted in most cases where it is desirable or necessary to include a window in an interior photograph, and it is by taking the trouble to make use of such expedients that the excellent workman is recognised.

---

THE Dowager Crown Princess the Archduchess Stephanie recently went to the Austrian Museum to inspect the International Exhibition of Artistic Photographers in Vienna. She was received by the director of the Museum, the president, and vice-president of the Club. First she looked at the photographs exhibited by the Archduchess Maria Theresa, the Patroness of the Exhibition, the Grand Duke of Tuscany, the Princess of Wales, and Count Henry Bardi. She told the gentlemen accompanying her that she occupies herself with photography a good deal for making sketches for pictures afterwards. She has taken many photographs at Venice and Naples. It was the seascapes which especially pleased her, and particularly the picture of Jersey, by A. R. Dresser, which work of art she desires to possess. The president will take the steps necessary for procuring her the picture. After staying nearly an hour and a half, her Imperial Highness took leave after again expressing her appreciation.—From the *Neue Freie Presse.*

## THE FABRICATION OF PHOTOGRAPHERS' VARNISHES.*

BY H. C. STANDAGE.

*Colouring of Varnishes.*—Sometimes it is necessary to give varnishes a certain colour, as, for example, a good lac varnish for lacquering brass-work. In such cases colouring substances that are soluble in alcohol are used. It is not necessary in these pages to give details for producing such coloured varnishes; they are not much used in photographers' work. But a few lines as to the best way to colour a varnish will be acceptable to some photographer who wishes to renovate the appearance of his camera, be it the metal work, mahogany frame, or leather bellows.

The suitable colouring material should be dissolved in alcohol, or a tinctorial extract made therewith; this should be filtered, and then this extract should be applied to the varnish. After the entire process of decolourising and filtering is finished, the extract should be as concentrated as possible, and enough of this saturated solution added to the fat varnish to produce the desired shade of colour. As a considerable quantity of the solution of many colouring substances has often to be taken for the purpose, it might be the case that, in consequence of this, the varnish would turn out too thin. This must, therefore, be taken into consideration, and the varnish must be made somewhat more viscid. When aniline colours are used, no attention need be paid to a possible thinning of the varnish in consequence of the addition of the solution of colouring matter, as these colours dissolve evenly, and are very productive in depth of colour.

*Recipes and Directions for Preparing Varnishes.*—Too frequently varnishes are empirically made, which is a most unsatisfactory way, as no haphazard work ever turns out satisfactorily. It is absolutely necessary to know *for what purpose* the varnish is to be used before a properly made product can be obtained. The different properties—as that of great hardness, which is always combined with a certain degree of brittleness, or elasticity and pliancy—can only be obtained by using different kinds of resin. The *hard resins*, like amber and copal, will produce very glossy, but also *quite brittle*, varnishes; whereas sandarac, mastic, elemi, and venetian turpentine possess the property of making varnishes more *pliant and tenacious.* The little variety of purposes, however, which the photographer uses varnish for restricts this quality to a few. The lacs and sandarac resin are the two chief ingredients used in photographic varnishes.

The first comprises several varieties—ruby lac, shellac, seed-lac, and stick-lac. The first is the natural product, while the second and third have been manipulated to give them less colour, so as to suit them for various purposes. The first, or ruby lac, is the best for the photographer to use in making varnishes, as the bleached kinds contain traces of the acids, &c., that have been used in the bleaching process.

If large quantities of the varnish are required, it is as well to keep a stock of dissolved resin, and diluting this to the proper consistency as occasion requires—*e. g.*, take of—

| | |
|---|---|
| Ruby shellac ... ... ... ... | 1 part |
| Alcohol (90 per cent. strength) ... ... | 5 parts |

Allow the resin to digest by frequent shakings or stirrings, and then set aside for several weeks to settle. This will

* Continued from page 451.

require no filtering, as all the solid particles will settle to the bottom, and the clean solution can be poured off for dilution when required.

Should the varnish thus prepared be too limpid or thin, it can be brought to the proper consistency by distilling off the excess of spirit. To do this an ordinary glass retort can be used; or place the varnish in a vessel, which stands in a large saucepan of boiling water, and keep the water boiling for an hour or two.

The peculiar contradictory properties—hardness combined with elasticity—which photographic varnishes must possess render their fabrication not always a certainty, and it is scarcely possible to give equal satisfaction with respect to both of them; for, besides the above qualities, they must be entirely colourless, adhere tightly to the glass, and yet be so constituted as to allow the plate to be retouched with a lead pencil; and yet the varnish must not crack when the plate is laid away, as this would mean the ruin of the photographic negative. Varnishes made according to the following formulæ can, however, be depended on, as they have stood the test of many years' experience.

FORMULÆ FOR VARNISHES.

*Varnish for Photographic Negatives.*

| | |
|---|---|
| Sandarac resin ... ... ... ... | 4 parts |
| Spirits of wine ... ... ... ... | 20 ,, |
| Chloroform... ... ... ... ... | 0·5 part |
| Oil of lavender ... ... ... ... | 3 parts |

To use this varnish, pour it when filtered on to the glass plate, and dry by applying heat. A perfectly colourless form, which does not crack even if the negative be stored away for a long time.

*Hard Lacquer for Photographic Negatives.*

| | |
|---|---|
| Sandarac resin ... ... ... | 7 ounces |
| Venetian resin ... ... ... | 0·7 ounce |
| Oil of lavender ... ... ... | 0·875 ,, |
| Ether... ... ... ... ... | 0·875 ,, |
| Absolute alcohol ... ... ... | 17·5 ounces |

*Retouching Varnish for Photographs.*

| | |
|---|---|
| Shellac ... ... ... ... | 0·035 ounce |
| Sandarac ... ... ... ... | 0·21 ,, |
| Mastic ... ... ... ... | 0·21 ,, |
| Ether... ... ... ... ... | 2·7 fl. dr. |

2·7 fluid drachms of pure benzole are added to the mixture after the resins have dissolved in the ether.

*Monckhoven's Retouching Varnish for Negatives.*—"Shellac is placed for twenty-four hours in a saturated solution of carbonate of ammonia in water. The solution is then poured off, and replaced by an equal quantity of pure water. The fluid is boiled under constant stirring until a complete dissolution has taken place. The proportion between shellac and water should be as 1 : 8. This is poured twice in succession over the negative, which must be thoroughly dry. Retouching can be done more quickly and finer upon this coating than upon any other."

*Elastic Dammar Lacquer for Photographs.*

| | |
|---|---|
| Dammar... ... ... ... ... | 1·4 ounce |
| Acetone (wood spirit) ... ... ... | 6·3 ounces |

The resin will be almost completely dissolved in a fortnight if the well-closed bottle containing the substance is allowed to stand in a moderately warm place. The solution should then be carefully poured off from the residuum. To apply the lacquer use a soft brush, and apply it several times.

*Photographers' Lacquer.*

| | |
|---|---|
| Mastic ... ... ... ... ... | 2 parts |
| Shellac (bleached) ... ... ... ... | 10 ,, |
| Oil of turpentine ... ... ... ... | 2 ,, |
| Spirits of wine ... ... ... ... | 60 ,, |

*Another Formula.*

| | |
|---|---|
| Amber resin ... ... ... ... | 1 part |
| Copal ,, ... ... ... ... | 1 ,, |
| Benzole ... ... ... ... ... | 2 parts |
| Alcohol ... ... ... ... ... | 15 ,, |

*Another Formula.*

| | |
|---|---|
| Amber ... ... ... ... ... | 2 parts |
| Copal ... ... ... ... ... | 2 ,, |
| Mastic ... ... ... ... ... | 1 part |
| Petroleum naphtha ... ... ... | 10 parts |
| Spirits of wine ... ... ... ... | 20 ,, |

Great care should be exercised in choosing the raw materials for photographic lacquers, as it is absolutely necessary that they should be entirely colourless.

There are many other formulæ, but the above will be found efficacious enough to need no addition.

## THE OPTICS OF THE LANTERN.*

BY J. TRAILL TAYLOR.

LET us now direct our attention to the *condensing* element of this optical system. We have seen that the two elements of the collecting portions must be fixed and inseparable. This, on the contrary, should be variable, and selected to suit the special end in view. Its form may be plano-convex, more especially if for use with long-focus objectives; but if the latter is to be short-focus, and the condenser of crown glass, then is the crossed form, in which the curves are as one to six, or two to thirteen, to be preferred.

But dealing, as we now are, with immergent parallel rays, it were folly to imagine that a condenser properly adapted for an objective of 12 in. focus will answer equally well for one of 6 in. Bearing in mind Kepler's law—which, however, applies only to one kind of glass, and must not be held as applicable equally to the flint glasses, especially those of the denser sort procurable at the present day—I would say that, for long-projection lenses of 12 to 15 in. focus, a plano-convex having a radius of curvature of 7 in. will serve every purpose; for an objective of 8 to 10 in., the radius may be 4½ in., while for one of 6 to 8 in., 4 in. will suffice. But, as I have said, this latter may, with advantage, be a crossed lens, in which case the radius of the more convex side will be longer.

One word more before dismissing the condensers. Treat them with the most scrupulous care, both in heating and cooling, and avoid allowing a current of cold air to play upon them during the cooling. With this precaution, superadded to having them set loosely in their cells, a fracture will rarely, if ever, occur.

Turn we now to the objective, the image-former. First, its diameter, especially that of its posterior combination, must be sufficiently large to take in not merely the whole of the cone of rays emerging from the condenser, but by preference a little more. This permits of the utilisation of a small portion of light radiated from the substance of the image itself.

A large back lens also permits it to be brought nearer to the picture, and this is advantageous, especially with

* Concluded from page 443.

the condensers of the common order, as it acts in condensing the scattered rays from those of this class, enabling also the light to be approached nearer to the condenser. The lens tube should be longer than in the case of its application to photography, for, unlike this, all it is required to cover is the very limited area comprised in a plate three and a-quarter inches square, minus the portion occupied by the mat. For the highest class of objective, it suffices that it be achromatic in the sense different from actinic, for, so long as the visual image is perfect, it matters not what becomes of the violet or chemical rays, or what relation they have to the luminous ones.

It is in the construction of a lantern objective of short focus that the skill of the optician is taxed, as it has to cover sharply to the margin with its full aperture, and under circumstances in which the slightest inequality in the definition is instantly detected. To a cultivated eye it is extremely unpleasant to see an image quite sharp in the centre of the disc, and falling off rapidly towards the margin, or by racking in securing marginal sharpness at the expense of the centre. Of the various forms of objective to be met with in commerce, at any rate for those of medium short focus, I incline to give preference to that introduced ten or eleven years ago by J. H. Dallmeyer, judging by the performance of one of this class in my possession, made by Newton and Co. In it the elements of the back lens are separated to an extent which would prove hostile to sharpness in the case of one employed in producing a photographic image in the camera. If photographic lenses are to be employed in the lantern, those of the carte-de-visite (Petzval form), that is, those corrected for flatness of field, even to the extent of there being slight astigmatism, are advantageous. One of the most satisfactory *short*-focus objectives I ever used had a back lens $2\frac{1}{4}$ in. in diameter, the front lens being $1\frac{3}{4}$ in. It gave a very great excess of negative spherical aberration to the back lens, and the front was a nearly plano-convex achromatic of short focus. This gave a field which was singularly flat, the definition at the margin quite equalling that in the centre; but, owing to the excess of aberration spoken of, the image did not quite equal in sharpness that obtained by the ordinary carte-de-visite lens with rounder field. Still, spectators seated at a distance of five yards from the screen were unable readily to appreciate that the definition was imperfect, for, as you know, even the crude brush-work of the scene-painter seems sharp when viewed from a distance.

In objectives of long focus there does not appear to be the same tax on the skill of the optician. Poor, indeed, must be the lens of 10, 12, or 14 in. focus that will not cover sharply and uniformly a plate 3 in. in dimensions.

DISCUSSION.

Commander GLADSTONE: Mr. Taylor said that in the ordinary commercial lanterns the whole of the back lens is not used. I found, in using the ordinary green glass condensers, that even taking the lime 3 in. away, you might cut off half an inch of the condenser all round, so that a 4 in. condenser becomes practically a 3 in. I think the principal point in the condenser is the glass of which it is made. We don't quite realise the amount of light which is lost in passing through the green glass condenser in the ordinary lantern; there is also degradation of tone, for the colour of the glass considerably interferes with the colour of the slide, especially if it has anything of a brown or mauve colour. Mr. Taylor says that the condenser he described takes in an angle of 95 deg.; if the back lens were $4\frac{1}{2}$ in., and the lime 2 in. away, that would be so. But I also understood him to say that the front lens was 5 in. in diameter, and if so, it seems to me that the effective angle is not 95 deg., because, taking the opening of the slide to be 3 in., the whole of the light collected by the back lens does not pass through it, it being in close contact with the condenser. I have no doubt that the system he has described is the proper one; you want first a collecting system to get parallel rays, and then to place in front of it a lens that you can adjust the focus of, and so adjust the cone for whatever lens you want to use.

Mr. ELDER: I might just point out one or two things. First, a method used by Professor Boys for saving his condensers from damage by heat. He places a sheet of plain glass against the condenser at a slight angle. Everyone knows how sensitive the ear is to the crack of glass under heat. When the lime gets pitted, or anything else goes wrong, this piece of glass cracks, he hears it, attends to the lantern, and so saves the condenser. The disadvantage of the plan is that it gives another reflection, and so wastes light. It can be used, unless very large work is being done, ample light passing through the glass for ordinary purposes. I was very much interested in what Mr. Taylor said about the position of the focus of the cone of rays coming from the condenser. But it seems to me there is a difference in practice in using the lantern and using the microscope; the same laws must apply, and yet there does seem to be a difference. My friends who use the microscope habitually say that to get the best effect they find it necessary to focus the radiant with the condenser on the object. One would therefore presume that, to get the best effect on the screen, it would be necessary to focus it on the slide, and not in the centre of the projecting system. It struck me whether it might not be possible to alter the whole system of projection by using a moderately large radiant brought to a focus on the slide. No doubt, if it were possible, the best system would be to use no condenser at all, but to put a large radiant—in fact, a sheet of light—close to the slide. Light is always lost in using condensers, and it is only because it is impossible to do this that we are compelled to use them. The next best thing seems to me to be to focus the radiant on the slide, thus making the slide the luminous object or origin of light as far as the projecting system is concerned.

Commander GLADSTONE: I have cracked a good many condensers, and I tried to see if I could not get something to interpose between them and the light. I tried all kinds of glass, but never found a piece that would stand the heat for ten minutes. I was using a blow-through jet, which I turned on until it was hissing, and left it there. If you attend to your jet, and don't let the lime get pitted, there is no danger at all. I tried chemical glass, Bohemian flask bottoms, unsuccessfully. At last I got a Sugg's lamp chimney, 16 in. long and 5 in. diameter, used for 500 candle-power light; I had it cut into four, and put one piece over the whole jet, and I have never cracked it yet.

Mr. ELDER: Professor Boys told me he found that his plan acted well, though he often cracked the piece of glass.

Mr. KAPTEYN: There is a rule that you must not let the sun shine on the lens. Is the principal reason of this because the glass of the lens is affected by the sunlight coming right into it? There are, of course, other reasons why, when taking a photograph, the direct sunlight should not be admitted.

Mr. TRAILL TAYLOR: If the 3-in. slide is close to a 5-in. condenser, there is a loss of light; but I have always taught that the slide ought to be movable, so that it can be brought to the point where the cone of rays is of the same diameter as the slide. The slide-holder ought to be really the moveble part of the lantern, in conjunction with the condensing lens, and if it were so, even the whole power of the light could be made to pass even through a 1-in. picture. The degradation of tone by green glass is more than anyone has any conception of. But there is another degradation of tone, and that is due to the printing of transparencies upon strongly coloured green glass, and covering them with another piece of the same colour. Most of them are exceedingly offensive in that way. Lay one on white paper and you will see the degradation. Many years ago I had some transparencies made on French crystal glass, the kind which was used for covering Daguerreotypes, and that, even when held edgeways, showed no colour. I was lately talking to Mr. Newton, sen., who pointed out that he had never lost a condenser since he had interposed a piece of slightly curved glass between the light and the condenser. The sun should not be allowed to fall on a photographic lens, because it sets up a variety of reflections which degrade the image, and it also degrades the glass itself. How that applies to the more recently introduced glass I am unable to say. Those who formerly used photograph lenses for solar enlargements complained that after a time they got slower, no doubt from that cause. It could not be from the effect of the light on the Canada balsam, for it bleaches that.

Mr. Little: A member of a photographic firm in Boston told me that they imported in one year £8,000 worth of French crystal glass for lantern slides alone. That may be a reason why the American lantern is ahead of the English lanterns.

Mr. Traill Taylor: The American commercial lanterns are bought in this country. What I had in my mind's eye were those made many years ago by Dr. Cresson and Professor Henry Morton, of Philadelphia. There were many exceedingly clever scientists there who devoted much attention to the lantern—men of the Zentmayer type, gentlemen connected with the Franklin Institution. When Professor Tyndall was lecturing over there he was "flabbergasted" by the great excellence of the lantern appliances, and saw monochromatic polarised light which he had never seen before. The price of the lenses I have described ought not to be great.

## NOTES ON LANDSCAPE.*

BY FRANCIS L. PITHER, ARCHITECT.

The subject we are met here to-night to examine is one that interests us all, from the youngest enthusiast, in the full glory of his spotless apparatus, to the oldest photographic hand, who can tell us all about the mysteries and hard work of the wet plate. And then we all have our own pet ideas on the subject, and with the facilities at our disposal, what easier than to turn out good landscapes? Should, perchance, a too critical friend dare to hint, however delicately, that this or that in our work might with advantage be altered or left out, do we not, in our heart of hearts, either think that he knows nothing at all about it, or else feel just the least twinge of the old enemy, the green-eyed one? Whether our candid friend be right or not, I desire to bring home to your minds what I sincerely believe to be a real stumbling block to the elevation of the study of photography. The facility with which our results are obtained will always be baneful so long as the subject is not studied in a more serious manner from its artistic side than seems to prevail; that is, so long as our minds are not tuned to a proper appreciation of the manifold aspects nature is constantly presenting. I mean an appreciation quite apart from the usual formulæ which now excite us most, such as "Where's the sun?" "Where's my actinometer?" "How long shall I give for this, I wonder?" &c. The truth seems to be that we are so wrapped up in "eiko" this and "pyro" the other, ounces wet and ounces dry, that we are fain to consider that a sharp image on the screen, and a sharper click of the shutter, is all that the field part of our work requires. It is all part of the love of the automatic penny-in-the-slot business that is fast fixing itself into our every-day life. As it bears upon photography, it is nothing short of a spirit of mischief which it should be our business to root out. I hold that we have no more right to think we can turn out pictures without thought and study beforehand, than to expect an elaborate piece of mechanism will work without steam.

I confess that the bulk of these remarks are, perhaps, not so much directed to the actual practice of photography as you might desire, but I must insist that, unless you are content to study the subject as it would be studied by those with less facile means of portrayal, you must be content to have your work qualified by the greatest drawback to all artistic production, viz., that of mechanical hardness. Now, I cannot but think that the line that divides this from one of the cardinal points of belief of a certain school of workers is an extremely fine one—in fact, almost non-existent—and yet we are taught by them to consider that microscopical sharpness from edge to edge is one of the first essentials to be aimed at. Now, in the earnestness, and with the full knowledge of the risk I am running of failing in your esteem, I tell you that this quality is far too much over-rated. That it deserves a certain amount of admiration none will deny, but, encouraged beyond a certain point, it will never fail to be utterly subversive of all feeling and tenderness by robbing your work of a great deal of its breadth. Of this, however, more hereafter.

I should say I am not now referring to photographic work of what might be called the still-life class, because I yield to no one in my admiration of a faithful, well-lighted, and technically perfect work, representing in its fullness of detail a complete transcript of any work in actual existence. Such productions have their proper sphere of usefulness, and are of importance in their way, but they do not rank as works of art, from the mere fact of the utter impossibility of impressing them with even a modicum of individuality. For example, one would not wish to deny that the legion of architectural and still-life photographs in existence have a value, but these things are only beautiful in so far as they are truthful, and, being truthful, admit of but one rendering.

Let me ask you to examine the subject with me as in the old days, when one's impedimenta consisted in nothing more formidable than a sketch block, a few choice pigments, and water from the nearest brook. One of the simplest and grandest rules I learned when sketching from nature, and withal one of the most difficult of application, is the great art of selection—in other words, to discover what may be left out; and, although it may sound paradoxical, I then found that the more one omitted, the better was the result.

Underlying the whole study of the graphic arts, whether applying to painting, portraiture—or photography, I had almost said—and more important than the technics of either study, is this art of selection, or seeing, or whatever other term may best convey to your minds the absolute necessity of not reproducing too much in a given area. It is not too much to say that this is a more neglected study than any other among an average community of photographers. We mostly lack the inclination, being far too busy with our every-day work, to bestow much time on such an apparently insignificant idea. This is, no doubt, how the majority will receive this suggestion, yet it is certainly true that the cultivation of this faculty is one of the chiefest aids to the success of some of our best men. Yet, as I have said, its acquirement is by no means so simple as appears at first sight, and for this reason. Professor Max Muller once told a friend of mine that this same hurry and drive of modern life was fast undermining the purity of the language colloquially speaking.

* Read before the North Middlesex Photographic Society.

People would not give themselves the time to say "thank you," it must be chipped to "thanks"; "doncherno," for "do you not know"; "bus," for "omnibus," and so on, *ad infinitum*; and so it is with photography. Now, it is not even easy to prescribe a sure method of approaching the study of the art of observation, because it holds, so to speak, the genius which finds its outward expresssion in whatever of individuality we may impress in our work, for no two persons will be similarly affected by the same scene. One will think this cloud too heavy, another that road too straight, a third that house too tall, and so on. No doubt some hair-splitter might be able to derive some profit from an examination and comparison of each set of likes and dislikes. I propose no such excursion, not wishing to send you to sleep.

Now there can be no doubt that individuality is the soul of all art work. If we go to any exhibition of paintings, and have a fairly current knowledge of the works of our leading painters, we shall be able to pick out certain works as coming from certain men, because we shall have become acquainted with their several leading characteristics, otherwise their individuality, and I take the liberty of saying that this should be the keynote of our aim in photography, and I care not how it is arrived at, all ranters about pure photography notwithstanding. If you questioned the methods of men who work in oil or water-colours, they would laugh at you for your pains. Why, then, should not all means be open to the production of a good sun picture? All roads lead to Rome; let us then tread forward to excellence along our own path. Be it admitted, however, once for all, that that path does not offer the same possibilities, cramped as we are by the exigencies of our method. Much may be done, however, by studying the works of one or two celebrated landscapists, and, being guided by the conclusions of such study, we shall find that our work will gradually rise from the commonplace in proportion as our intelligence to bend methods is adequate. There is no royal road in this as in other things. As a practical illustration, I would remind you that one of our greatest landscapists built up much of his manner during a certain period of his practice upon the works of a foreign artist. Take any of the less allegorical canvases of Claude, and in the front of the middle distance put a group of Scotch firs, or other prominent mass in the landscape, and you have the difference that exists between a Claude and a Turner. I am aware that the practice is not directly applicable to photography, but if you seize the principle of it, you will find yourself only taking scenes from such points of view as will give you some such prominent feature to qualify your composition, and will thus gain individuality. By this means the planes of your picture will be in better relation the one to the other, a quality not always met with in an average photograph. But you may say, "Granting I have found such a scene, I may have correct exposure, development, and printing, and yet the sought-for individuality may still be wanting." I must say I do not think it should be so, but should you, in the manifold chemical labyrinths with which we are beset, happen to be so far unsuccessful, then with the view in your mind and your shortcomings before you, apply a few broad washes of very light India ink to your negative, and so establish the balance you seek for. I have said it is necessary to exercise a certain process of selection in order to work out a completely satisfactory composition; but quite apart from this there lies a wide field of study for us—a field only rendered possible by the very nature of our craft. Depend upon it, a very respectable reputation awaits the man with time and inclination to go out with his camera into the fields, and, as it were, wait upon Dame Nature. It is no small boon to have at command the means to catch the passing gleam of sunshine as it glides over the landscape, changing in the twinkling of an eye an expanse of dreary grey into a veritable glimpse of fairyland, or again, to be able to carry home in his slide that delicious ripple across the stream, with just a suspicion of movement in the trees or on its banks to account for it. These are things worth watching and waiting for, and not, as we are told, to wait until the beastly wind drops. One who will work in some such manner may, and indeed will, be scoffed at by the aforesaid school as a careless student, and perchance incur the awful risk of being branded as a "naturalistic"; but what are these things to count against honest endeavour to impart that which is sadly wanting in the majority of photographs, viz., just a touch of the soul within us?

*(To be continued.)*

## SOME NEW ADDITION COMPOUNDS OF "THIO-CARBAMIDE" WHICH AFFORD EVIDENCE OF ITS CONSTITUTION.*

BY J. EMERSON REYNOLDS, M.D., F.R.S., PROFESSOR OF CHEMISTRY, UNIVERSITY OF DUBLIN.

In the course of Part IV. of a series of papers on "Silicon Compounds and their Derivatives" (Trans., 1888, 53, 857), I gave some account of a beautiful white crystalline substance which was one of the most abundant products of the action of ethylic alcohol on the compound $(H_4N_2CS)_8SiBr_4$, described in a previous communication (Trans., 1887, 51, 202). The product referred to was shown to consist of the elements of four mols. of thiocarbamide and one mol. of ammonium bromide, whilst its synthesis was effected very simply by heating together the two substances in the above proportions and in presence of absolute alcohol.

It was also pointed out that other halogen compounds of ammonium and of some of its derivatives could be made to unite with thiocarbamide, and afford substances similar to tetrathiocarbamidammonium bromide. But the members of this group of compounds—other than the first—were only mentioned incidentally, as they had not been examined in detail at the time of publication of the paper in which the products of the decomposition of the silicon compound were described. When closely studied, however, they proved to be of more interest than I had supposed, for it soon became evident that they do not all conform to a single type, but exhibit significant variations in composition which is connected with the peculiar constitution of thiocarbamide.

In the following account of these compounds I shall first describe their preparation and properties, then give a summary of these facts, and conclude with some considerations suggested by the evidence.

In the descriptive part, I have given some further details relating to the ammonium bromide compound, as an interesting practical application of the substance has recently been made by Colonel Waterhouse to the production of direct *positive* photographs. So effective is this agent in securing the reversal of the photographic image on gelatino-bromide films, that the presence of less than

* From the *Journal of the Chemical Society*.

$\frac{1}{100}$th of a grain per ounce in "eikonogen" developer causes the negative image that first appears to change into a rich-coloured positive.

DESCRIPTIVE PART.

A.—*Compounds of Thiocarbamide with Ammonium Haloïd Salts.*

It has been already mentioned that the well-defined crystalline solid $(H_4N_2CS)_4NH_4Br$ was obtained, in the first instance, by the action of ethylic alcohol on the compound which results from the union of silicon tetrabromide with 8 mols. of thiocarbamide; and that the same substance was subsequently prepared by the direct action of ammonium bromide on thiocarbamide. The latter or synthetic method is the only one with which I am now concerned; it afforded the best result when conducted in the following manner:—10 grams of ammonium bromide were dissolved in the smallest quantity of hot alcohol required for its solution, and this liquid was added to a boiling and nearly saturated alcoholic solution containing 30·4 grams (4 mols.) of thiocarbamide. The mixture was boiled for five minutes, and then allowed to cool in the containing flask. The contents soon began to deposit warty aggregations of radiating crystals which attached themselves to the bottom and sides of the vessel, and, when quite cold, the whole formed a nearly solid and beautiful white crystalline mass of characteristic appearance. When drained, pressed, and recrystallised from alcohol, it is obtained in a perfectly pure state. In this condition it was analysed, with the results already stated (*loc. cit.*).

Tetrathiocarbamidammonium bromide melts at 173—174°, but begins to decompose at 178—180°. It is easily soluble in boiling absolute alcohol, but is so much less soluble in the cold liquid that the hot saturated solution becomes nearly solid at ordinary temperatures. More dilute solutions, when slowly cooled, deposit the compound in large and beautiful stellate groups of crystals, which often resemble sea anemones in appearance. It is almost insoluble in ether, chloroform, and benzene, but is rather easily soluble in water. When pure, its aqueous solution can be boiled violently for half an hour without undergoing sensible decomposition; but if impure in the first instance, partial decomposition occurs. It is easily broken up by boiling with dilute acids and alkalis, and is readily desulphurised by alkaline lead tartrate.

Having determined the composition and principal properties of the tetrathiocarbamide compound, it remained to be seen whether ammonium bromide could combine with 1, 2, or 3 mols. of thiocarbamide in presence of alcohol. To test this point three separate experiments were made, in each of which 1 molecular proportion of ammonium bromide was heated in alcoholic solution with 1, 2, and 3 mols. respectively of thiocarbamide under precisely the same conditions as those which suffice for the production of the tetrathiocarbamide compound. In each case a quantity of the tetrathiocarbamidammonium bromide was obtained proportional to the amide added, and the excess of ammonium bromide separated when the mother liquors were concentrated. No traces were observed of any but the tetra compound under the abovementioned conditions, or under any other hitherto tried. It therefore appears that ammonium bromide and thiocarbamide do not combine in any other proportion than that of 1 mol. of the former to 4 mols. of the amide.

(*To be continued.*)

## Notices of Books.

TRAITE ELEMENTAIRE DE L'OBJECTIF PHOTOGRAPHIQUE. By E. Walton. (*Paris: Gauthier-Villars et fils.*)

THE author of this book, M. E. Walton, who is professor of physics at the *Lycée Janson de Sailly*, has endeavoured to follow on and complete the work initiated by Monckhoven in his "Optical Photography," and he has succeeded in producing a work which is a complete exposition of the subject with which it deals. Here we find explained the phenomena of refraction; the laws by which it is governed; a detailed account of the various lenses employed in photography, from simple forms to compound ones; the effect produced by aberrations, and the means employed for correction, &c. The book contains 300 pages of most useful matter. It is well printed, and is fully illustrated with clearly drawn diagrams. It is issued in paper covers, the leaves are uncut and have a very broad margin. Many of our English publishers would do well to take a hint from this commendable practice, for it is one which tempts the owner of such a work to have it well bound.

HANDBUCH DER PHOTOGRAPHIE FUR AMATEURE UND TOURISTEN. By Major G. Pizzighelli. (*Wilh. Knapp, Halle a S.*)

THIS is a second edition of the first volume of a comprehensive hand-book for the value of which the name of the author is a sufficient guarantee. The first edition was published in 1886, and consisted of 436 royal octavo pages; but since its issue the modifications and advances in photography have been so great and rapid as to necessitate not merely a complete revision, but a substantial enlargement of the book. The present edition is, therefore, extended to 486 pages, the text admirably elucidated by some 531 illustrations, and treats most fully of photographic apparatus. The succeeding volumes will deal with photographic processes, and the practical applications of photography.

TRAVELLERS' COLLOQUIAL GERMAN. By H. Swan. (*London: David Nutt.*)

A USEFUL little compilation, which forms No. 2 of the "Phonetic" series of hand-books for English-speaking travellers and students. No. 1, "Travellers' Colloquial French," in its third edition included an Appendix for Cyclists and Photographers. It may be hoped that, should the book before us attain, as it deserves, a third edition, it also will contain a section which could not fail to be useful to travelling photographers unacquainted with the German language; at present cyclists only are favoured. There is, however, a large amount of general information that will make the little book most serviceable.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—The second out-door meeting of the season was at Ripon and Studley Park, on Thursday the 18th. Upwards of 200 plates were exposed, mostly upon the ruins of Fountains Abbey.

"FALLOWFIELD'S Photographic Annual for 1891," just received, is a book of over 500 pages, for the most part consisting of a comprehensive illustrated catalogue of photographic materials, chemicals, and apparatus, but containing also a large amount of useful information on various topics connected with the practice of photography.

## Notes.

It has often been rendered painfully apparent to photographers that it is not desirable to photograph all subjects indiscriminately in a French town. If a picture should unfortunately contain the image of a fort, or any other thing of a military nature, or should even be suspected of doing so, the unfortunate possessor of the camera speedily finds himself in durance vile. Many innocent tourists have been put to the gravest inconvenience in being detained in this manner, under the suspicion, of course, of being Prussian spies. Indeed, ever since the Franco-Prussian war our French neighbours have been mad on the subject of spies, and have not yet recovered from the hallucination.

We were not, therefore, very much distressed when we read the other day, in the *Telegraph's* "Paris Day by Day," that a French barrister taking photographs of the German soldiery in one of the conquered provinces—no doubt innocently enough—had been "run in." He was merely amusing himself by taking a few shots with an amateur's camera at a regiment of German dragoons marching back from exercise, when he was arrested and taken before the police authorities, who only allowed him to go on the promise that he would take the next train for the French frontier. The precious plates were detained, and are to be officially examined, but with what object it is hard to determine.

In the meantime, it would seem that the French are about to render France still more uncomfortable to the tourist photographer. The Espionage Bill, which it is proposed to pass, enforces penalties of a most severe description on spies of all kinds. If, for instance, anyone procures admission to a fortress, dockyard, man-of-war, or naval or military establishment by means of a disguise, false name, or untrue statement, and, acting as a spy, obtains information calculated to compromise the defence of the territory, he will be liable to condemnation to death; and the same penalty will be meted out to those who, for purposes of espionage, may have made surveys, drawings, or plans; organised or employed means of correspondence, or collected intelligence with the same detrimental object. If a hurriedly made plan or drawing subjects its author to death, what awful fate is reserved for him who produces the far more accurate and, therefore, more harmful photograph? We advise our friends to steer clear of France if this bill should become law.

It too often happens that the inventor of a good thing gets very little either of credit or profit out of it, the shrewd man of business coming in and possessing himself of both. We were reminded of this truth the other day, when we saw, in a French photographic journal, the description of a "new" dark back for films. This back does not open book-fashion in the usual way, but has a space inside filled in with a removable partition of ebonite. Over this flexible slip is folded a double band of film, sufficient for two exposures, and the partition is replaced. This *new* device was patented in Great Britain about eight years ago by Mr. Vergara, when that gentleman was doing his best to introduce the unfortunate Woodbury film to the notice of photographers. The idea is a good one, and Mr. Vergara should certainly retain the credit for it.

M. Schlumberger, the French chemist whose successful imitations of bank notes led to his being prosecuted by the Government, has convinced the Bank of France that his statements and experiments were made in the interests of the public, and his appeal against the fine of 500 francs will probably be successful. Owing to his demonstration that in these days of scientific photography special precautions are necessary to guard against forgery, a small army of chemists, photographers, and engravers are hard at work in the production of a note which shall baffle the most ingenious imitator. Safety against counterfeiting, it is hoped, will be attained by having several vignettes—each struck in a different colour—placed in superposition, and by having the fabric of the paper made in a special tint. Colours of deep tints are to be used, which will offer an equal resistance to chemical action, and which it will be impossible to separate. In the fabric of the paper will also be introduced a light muslin tissue printed in special colours, visible only when held to the light.

Nothing is sacred to the enterprising advertiser. It is dreadful to think that when the tourist photographs the pyramids, he must also photograph "Popham's Pills." Yet we are within measurable distance of this. Who, for instance, would imagine that the Straits of Magellan would be made use of as an advertising station? There is a small rock in an inlet called Gray Harbour, which is between Wellington Island and the Patagonian mainland, on which rock it is etiquette for steamers passing through the Magellan Straits to leave a card in the shape of a board with the name of the vessel and date painted thereon, and nailed to the rock. The captain of a telegraph ship, anchoring in Gray Harbour, lately took a photograph of the rock, and to his disgust found that the most prominent "card," covering nearly the entire lower face of the rock, was one which contained the advertisement of a well-known soap manufacturer!

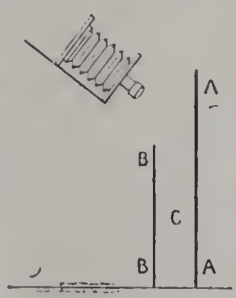
It is not generally known that at the top of that retiring and modest, but extremely useful, building the Patents Office, in Southampton Buildings, is a suite of photographers' rooms. It was lately said by a technical journal that this photographic establishment was a thing of the past. This is not the case. Work is still being carried on when necessary. It is obvious that, in connection with the copying of designs and plans, photographic facilities are indispensable.

The difficulty of securing photographs of notabilities when it is desirable that a complete collection should be made is well known. First, there is the consent of the individual to be obtained, next comes the appointment at the studio, and thirdly, and most important of all, the keeping of the appointment. Indeed, the worry and disappointment are so irritating, that all photographers who have commissions of this kind entrusted to them would welcome an imitation of the plan adopted in the Austrian Parliament, in order to comply with the request of the Emperor Francis Joseph for photographs of all the members. The president, during a full sitting of a House, simply said first to one representative and then to another, just as it was necessary, "Herr So-and-So, do not move," and the photographer secured the necessary portrait. We should like to see this experiment tried by the Speaker of the House of Commons; it would serve to enliven many a dull sitting, and would certainly highly amuse the "strangers" present.

## IMAGES MULTIPLIED BY REFLECTION.

MANY pleasing effects can be produced by the introduction of a mirror into the photographic studio, and in intelligent hands the changes which can be rung on such an aid to picture making are endless. We venture to think that the use of the mirror is not so common as it might be, and that many photographers would do well to show their patrons what can be done in this direction. What more natural than the figure of a lady standing before a pier glass giving that little finishing touch to her dress which is always such a necessary duty of life? The mirror can also be used for giving a back as well as a front view of a model, and this, while adding to the charm of a picture, will be a thing which no lady will object to—for in a measure she will get two pictures at the price of one. Many other attitudes possible with mirrors will suggest themselves to the worker who possesses any originality of ideas. It is almost unnecessary to remark that beyond a little care which is necessary in avoiding reflections which are not wanted, the employment of a mirror in the studio presents no difficulties whatever. No difference in exposure is called for, and the reflected image of the model may, in fact, be left to take care of itself.

Those of an experimental turn of mind can produce by means of two mirrors combined the curious effect illustrated in the accompanying woodcut. This is the copy of a photograph which appeared some time since in a French publication, and it will at once remind our readers of an effect which they must have often noticed in public places where two looking glasses face one another on opposite walls, and lead to reflections repeated again and again. The picture is produced by an arrangement of mirrors placed in exactly the same way, but which is illustrated in the diagram below. Mirrors A A and B B are placed opposite one another, while the model C stands between them. One mirror, B B, is shorter than the other, and behind and above it the photographic camera points downwards at the model. In this way a single son of Mars might be turned into a regiment of soldiers, and one feels sorry that some such means is not available at stage representations, where, time out of mind, it has been the custom to add to the number of an army by causing the same file of men to march round and round the same imitation tree or rock. It is possible that this little photographic curiosity may lead some of our readers to try what they can do with the help of looking-glasses.




## USE OF SILICATE OF POTASH IN LITHOGRAPHY.

SILICATE of potash, dissolved in pure water, plays an important part in chromo-printing. By modifying the liquor gradually as required, its use permits of producing very clear tones by the addition of a thin varnish, without having recourse to magnesia, whiting, or any other white substance, which nearly always entail the risk of producing clamminess. By adding a few drops of silicate to a colour reduced to a syrupy state, strength is imparted without in the least lessening transparency. The addition of varnish renders the colour clearer, while the silicate gives it consistency; only the silicate must be used drop by drop. Experience will be the best guide as to the use of this substance. The liquid silicate should be preserved in a flask corked with emery, as the air decomposes it.

*How to Bring up Crayon Drawings.*—When a drawing becomes thin and pale, the roller is choked up, or the black is not sufficiently ground. This paleness is often caused by the indiscriminate use of acid mixed with distilled water in damping, or by vinegar. In the first case, clean the roller, and take thinner black. In the second, two remedies may be used. Remove the drawing by means of a preparation of thirty parts of essence of distilled turpentine, and two parts of olive oil, thoroughly mixed. The drawing removed, ink it with a black a trifle more adherent than that used in printing; pull a few proofs, and if the drawing recovers its primitive purity and vigour, proceed with the printing. When this remedy fails, recourse should be had to pure essence to remove the drawing. Afterwards ink with a preserving ink, gum, and place the stone aside for twenty-four hours.

*Inconvenience of Enamelled Paper.*—These papers absorb a part of the substances serving to bind together the solid elements of the ink; consequently, the black particles remain like dust on the enamel, and are detached by the least touch. An ink having a greater adherence may be produced by adding a rich resinous varnish, similar to that used for bronzing.

*Glycerine prevents fine colours from drying in the box* if precaution be taken to cover them with a thin layer of this liquid. The surface of the colours should be previously smoothed over.—*Printing Times and Lithographer.*

PHOTOGRAPHIC CLUB.—Subject for discussion on July 1st, "Actinometry and Sensitometry"; July 8th, "View Meters and Finders." Saturday outing, June 27th, the Brent from Hanwell; train to Hanwell from Paddington at 2.50.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Agar-Agar once more—New Process of Making Printing Plates—Blisters in Gelatino-Bromide Prints—Platinum Printing—Who is Rembrandt?

*Agar-Agar once more.*—With reference to my own remarks on agar-agar as a substitute for gelatine in emulsion making on page 381, I may add here the observations of V. Schumann with regard to the same subject which this eminent investigator published some time ago in the *Phot. Wochenblatt* (vol. xi., p. 164). He writes:—"Agar-agar bromide emulsion is sensitive from about 6½ F. up to the ultra-violet, much like the gelatino-bromide emulsion, the lines being clear. Agar-agar emulsion shows scarcely any tendency to adhere to the glass plate, except at the edges. The plates are entirely matt. Some emulsion poured on glass, dried, then washed and again dried, was totally fogged, though it gave a weak image of the spectrum at an exposure of fifteen minutes (paraffin lamp). Agar-agar soaked with ammonium bromide and cooked dissolved little or none at all. Agar-agar cooked for a longer time, after the addition of bromide, emulsified, and poured at once unwashed on the plate, gave, when the plate, after washing, was treated slightly with alcohol, a rather good negative, provided it was not washed. In the bath following the fixing bath, the agar-agar film left the glass plate, and was lost beyond recovery."

*New Process of Making Printing Plates.*—Mr. Fr. Winterhoff, of Cologne, has patented a process of making glass printing plates for typographic and lithographic purposes, which will, I think, be of interest to photo-lithographers. It consists in the following:—A glass plate is coated with a sensitive solution of asphaltum, or with bichromated gelatine, and dried; a print is then taken from any printing plate—from a negative, for instance—on a well-prepared transfer paper, which is then transferred to the glass plate provided with the sensitive layer. The transfer paper is then removed, and the transferred print on the glass plate dusted with metallic powder—for instance, with bronze or leaf metal—when the plate is well cleaned. It is then exposed to sunlight for about half an hour, and washed with turpentine, which dissolves the unexposed parts of the layer, whilst it leaves unaltered those portions which have been exposed to light. The plate is then etched very deeply with fluoric acid for about half an hour, rinsed, and cleaned, when it may be used as a printing plate. From this plate, transfers may be made at any time, to be transferred to stone or to zinc, or the plate may itself be employed directly as a printing plate without fear of wear and tear. These plates afford a very practical substitute for the expensive lithographic stones or zinc plates.

*Blisters in Gelatino-Bromide Prints.*—Blisters are sometimes met with in work with gelatino-bromide paper. To avoid them, the *Photogr. Archiv* suggests the following procedure. It is necessary to use the water and the various baths as cold as possible, and to do the work in a laboratory the temperature of which is not above 68° F.; use should also be made of alum. After development, the print is washed for a few seconds in two water baths, when it should be placed for three minutes, picture side down, in a bath of

| | |
|---|---|
| Water ... ... ... ... ... | 200 c.c. |
| Alum ... ... ... ... ... | 12 grammes |
| Common salt ... ... ... ... | 6 ,, |
| Soda ... ... ... ... ... | 1 gramme |

The print is then allowed to drain, and, *without washing*, placed in the fixing bath. The latter consists of

| | | |
|---|---|---|
| No. 1.—Water ... ... ... ... | | 200 c.c. |
| | Hyposulphite of soda ... ... | 30 grammes |
| No. 2.—Water ... ... ... ... | | 40 c.c. |
| | Alum ... ... ... ... | 12 grammes |

The mixture of the two solutions is allowed to stand for a day. In this bath the print should remain five minutes in summer and fifteen minutes in winter, during which time it should be repeatedly turned. It is then, *without washing*, placed in the already used alum bath, with the film side down. This alum bath should not be used again.

*Platinum Printing.*—R. Wischeropp recommends the following platinum printing-out process. It is essential to use a chemically pure ferric salt, and to dry the solution as quickly as possible after its application to the paper, in order that it may not penetrate into the paper. For this purpose a dry box is necessary, kept at a temperature of 133° F., so that the prepared paper placed in it may dry within two minutes. The solutions required in this process are, according to the *Phot. Nachrichten*, the following:—

*Solution A.*

| | |
|---|---|
| Sodium ferric oxalate... ... ... | 40 grammes |
| Sodium oxalate solution (3 : 100) ... | 100 c.c. |
| Potassium chlorate ... ... ... | 0·1 gramme |

*Solution B.*

| | |
|---|---|
| Distilled water ... ... ... | 60 c.c. |
| Potassic chloro-platinite ... ... | 10 grammes |

In Solution A the solutions, which are kept separately in the Pizzighelli process, are united; then the addition of glycerine, which is declared needless by the author, is left out. Solution B keeps indefinitely, whilst Solution A should be renewed from time to time. To sensitise one sheet of arrowroot paper, 8 c.c. of Solution A and 5 c.c. of Solution B are required. The sheets of paper are fastened with drawing pins to two wooden strips, one of which projects sufficiently to enable the sheet to be placed on the edges of the dry box. The latter is made of sheet iron, and is warmed by a gas boiler, the paper being suspended in it in such a manner that the second wooden strip remains about four inches distant from the bottom of the box. The solution is quickly applied to the paper with a bristle brush, spread with a round badger-hair brush, and then the sheet is quickly hung therein. In order that the paper, after drying, may give brilliant prints, it should be kept for some time previously in the dark room. It is then laid, together with the negative, in the printing frame, and covered all over with india-rubber cloth. As soon as the desired tone is attained, the print is fixed in a solution of hydrochloric acid 1 : 80. The fresher the paper, and the more quickly it is worked, the more beautiful will be the tones of the prints. For this reason it is advisable to print in direct sunlight.

*Who is Rembrandt?*—A very remarkable book has been published of late by a young literary man, Max Lautner, of Breslau, which has excited much attention in artistic circles in this country. In this work the author endeavours to demonstrate that most of the celebrated paintings attributed hitherto to Rembrandt are really the work of one of his most talented pupils, namely, of Ferdinand Bol, of Metheln, near Antwerp, whose name has been scratched or painted over on his works, and the name of Rembrandt substituted. In his researches, the author has made use of photography, which has been able, so to say, to look through the various layers of colour down to the ground of the painting, and there to detect any falsification. The author has discovered a new process of intensifying, by the use of which one is enabled to intensify without retouching the contrasts of the tones to such a degree that quite faint shades appear black on a white ground. By the aid of this process the author has reproduced about one hundred paintings attributed to Rembrandt, and all of them showed clear traces of the name of Bol scratched in the fresh paint before varnishing. The negatives have been reproduced in photogravure by Riffarth, of Berlin, the impressions being distributed on seven tables, forming part of the important and interesting book.

## PARAMIDOPHENOL COMPARED WITH HYDROQUINONE AND EIKONOGEN.

BY AUGUSTE AND LOUIS LUMIERE.

In a recent article* we indicated generally the principal properties of paramidophenol, considered as a developer of the photographic image, and it seemed to us interesting to establish, with more detail and exactitude, a comparison between these properties and those of the developers most nearly like it as to constituents and mode of action—hydroquinone and eikonogen.

### (a)—Oxidization from the Air.

When aqueous solutions of one-half per cent. of paramidophenol, hydroquinone, and eikonogen are exposed to the air, it is found that paramidophenol oxidises most rapidly; the alteration in eikonogen becomes clearly visible after several hours, which hydroquinone resists still longer.

The product of oxidisation of paramidophenol, which is probably quinonimide, is insoluble in water, hence it results that the aqueous solution does not discolour when exposed to the air; it furnishes gradually a black precipitate, which dissolves with a violet colour in ammonia and the alkalies, and with a red colour in nitric acid.

In the case of eikonogen, the oxidized solution is dark brown; it becomes green when treated with ammonia, and red when treated with nitric acid. The oxidized solution of hydroquinone is reddish; the liquid added to ammonia takes a yellow tint, although it is rendered colourless by the acid. These oxidisations have a different effect upon the gelatine according to the developer used. It takes a yellow tone in the case of hydroquinone and eikonogen; but the gelatine remains perfectly colourless in the case of paramidophenol. This is so much the case that, although one invariably obtains a yellow tinge after developing several negatives in the same bath of hydroquinone and eikonogen, it is easy to develop, in 100 cubic centimetres of paramidophenol, twenty-five negatives 9 by 12, printed under identical conditions, without detecting the least discolouration, and without being able to detect any difference between the first and the twenty-fifth plate developed.

### (b)—Action of Oxygen.

In passing a current of pure oxygen through the aqueous solutions of the three liquids which we have been discussing, we find that the paramidophenol oxidizes first, then the hydroquinone, and lastly the eikonogen. In all three cases the oxidisation by pure oxygen is less rapid than by air, all the other conditions of experiment remaining the same.

### (c)—Action on Salts of Silver.

The aqueous solutions of hydroquinone, paramidophenol, and eikonogen do not reduce the silver haloids without the addition of an alkali or of an alkaline carbonate, although the same solutions reduce soluble salts of silver perfectly without the help of a base. Neither paramidophenol nor hydroquinone possesses the curious property* of eikonogen of reducing solutions of nitrate of silver strongly acidulated by nitric acid.

### (d)—Other Reactions.

The perchloride of iron colours paramidophenol a violet-blue, and eikonogen yellow. With hydroquinone it produces a greenish colouring, which fades very quickly, and ends in becoming yellow. Paramidophenol has a reaction very slightly acid. With eikonogen, nitrate of lead gives a very pale violet-grey precipitate. It gives no effect with paramidophenol or hydroquinone.

### (e)—Determination of the Reducing Power of Paramidophenol.

We have employed the same process which M. Reel† adopted in the case of hydroquinone—a process which consists in determining the weight necessary of a given substance to reduce one gramme of nitrate of silver. We have arrived at the following result:—

| | |
|---|---|
| For hydroquinone ... ... ... ... | 0·07 |
| ,, paramidophenol ... ... ... ... | 0·14 |
| ,, eikonogen ... ... ... ... ... | 0·30 |

Thus, it is to be seen that it requires twice as much paramidophenol and four times as much eikonogen as hydroquinone to reduce the same weight of nitrate of silver. These differences are not important from a practical point of view, for the reducing action in a developer is always greatly in excess of the quantity of silver to be reduced. The developer has done its work long before it is exhausted.

### Conclusion.

The three substances that we have been studying possess, from a photographic point of view, analogous properties. Paramidophenol, however, seems to present the greatest advantages. (1) It oxidizes more rapidly than hydroquinone and eikonogen; it is also more energetic, and, all the conditions being equal, it develops most rapidly. (2) The products of oxidisation have no effect on the latent picture, and do not discolour the gelatine, whence the possibility of developing in the same bath of developer a very much greater number of plates than with the other developers.

In making variations in the developing solution of the proportions of sulphite of soda, carbonate, and paramidophenol, in order to arrive at the best compound and the best working, we have found it convenient to modify the proportions as in the following formula:—

| | | |
|---|---|---|
| Water ... ... ... ... ... | 800 | parts |
| Carbonate of potash ... ... ... | 40 | ,, |
| Sulphite of soda ... ... ... ... | 100 | ,, |
| Paramidophenol ... ... ... ... | 8 | ,, |

Obituary.—We regret to announce the death, on Tuesday last, following an attack of influenza, of Mr. Lachlan McLachlan, of Manchester. Among Mr. McLachlan's great photographic pictures may be especially mentioned the group of members of the Cotton Famine Relief Committee, and that of "The Royal Family at Windsor." The latter work measures 17 by $11\frac{1}{2}$ feet, and the negative 41 by 29 inches. Mr. McLachlan, it is said, spent £16,000 upon its production, and worked for eight years before he considered he had adequately completed his masterpiece. During his career, he had photographed the greatest celebrities of the day, and had visited every Royal circle in the civilised world. He was in the 67th year of his age.

* Photographic News, page 379.

* *Moniteur de la Photographie*, May, 1891, page 71.

† *Moniteur de la Photogr.*, page 72.

## Patent Intelligence.

### Applications for Letters Patent.

10,101. John Joly, 39, Waterloo Road, Dublin, "Improved Method of Obtaining Solar Altitudes by the Aid of Instantaneous Photography."—June 15th.

10,139. Richard Moser, 4, South Street, Finsbury, London, "Improvements in Photographic Albums."—June 15th.

10,241. George Lyons, 19, Somerset Street, Portman Square, London, "Improvements in Portable Photographic Cameras and Camera Fronts."—June 16th.

10,245. Joseph Robert Mally, 18, Fulham Place, Paddington, London, "Improvements in and relating to Frames for Supporting and Exhibiting Photographs, Views, and the like."—June 16th.

10,246. Joseph Robert Mally, 18, Fulham Place, Paddington, London, "Improvements in and relating to Wall Brackets, for Supporting and Exhibiting Photographs, Views, Figures, and the like."—June 16th.

10,278. Etienne Ricard and Jean Baptist Joseph Lacroix, 323, High Holborn, London, "Improvements in Photographic and Stereoscopic Apparatus." (Date applied for under Patents Act, 1883, Sec. 103, January 8th, 1891, being date of application in France.)—June 16th.

10,379. Frank Sternberg, Hillside Cottage, Bushey, Herts, "An Improved Method of Embellishing Photographs."—June 18th.

10,482. John Alexander Forret and Frederick Dundas Todd, 26, Brougham Place, Edinburgh, "Improvements in Means or Apparatus for Producing a Flash Light more especially Applicable to Photography and Stage Effects."—June 20th.

10,506. Edward James Clifford, 127, Upper Dorset Street, Dublin, "A Hand or Detective Camera and Shutter."—June 20th.

### Specifications Published.

985. *January 20th*, 1890. — "Pigment." H. Grimshaw, Canal Chemical Works, Clayton, Manchester.

A white pigment, consisting of an insoluble zinc compound, is prepared by dissolving metallic zinc, or zinc oxide, in a solution of zinc chloride by the aid of heat, and then precipitating the pigment by cooling, with or without the addition of an alkali. Another process consists in mixing zinc oxide with zinc chloride solution, producing a mixture which sets hard, and may be ground to a powder.

1,015. *January 20th*, 1890. — "Alkali Manufacture." F. Ellershausen, Hebburn-on-Tyne, Durham.

Relates to the manufacture of caustic soda and potash. Sodium sulphide solution is treated with sodium ferrite (ferrate), either by simply stirring up the latter in the solution, or preferably by forming a layer of the ferrite in a granular form about four feet deep, and filtering the solution through it. The reaction which takes place may be expressed as follows:—

$$Fe_2O_3Na_2O + 4H_2O + 4Na_2S = Fe_2Na_2S_4 + 8NaOH.$$

The caustic soda is obtained as the filtrate, while the double sulphide in the filter bed may be treated in any way. The ferrite in the granular form is obtained by roasting a mixture of sodium carbonate and peroxide of iron. Caustic potash is similarly obtained.

1,016. *January 20th*, 1890. — "Alkali Manufacture." F. Ellershausen, Hebburn-on-Tyne, Durham.

Relates to a process for the manufacture of caustic soda and potash, consisting of two stages:—

1. *Preparing ferrite (ferrate).*—This is prepared by mixing a strong solution of black ash or potassium carbonate with powdered iron peroxide to form a thick, pasty mass, which is then calcined in a furnace, forming the ferrite.

Richmond Camera Club.—An excursion to Shepperton was arranged for the 13th inst. The three members who put in an appearance found some excellent subjects in the neighbourhood. The ordinary meeting was held on Friday, the 19th, Mr. Davis in the chair, when the subject for discussion was "Tourist Kits."

## Correspondence.

### THE CAMERA CLUB.

Sir,—Will you kindly allow me to state that the exhibition of photographs by the Marquis Dr. Vianna de Luna and the Countess Loredana da Porto Bonin, which was announced to be opened at the Camera Club on Tuesday, June 25th, is unavoidably postponed.

The exhibition will commence on Thursday, July 16th, after which date the pictures will be open to inspection by visitors under the usual conditions, namely, from 10 a.m. to 4 p.m., on production of tickets which may be obtained from the hon. secretary and from members generally.

G. Davison, Hon. Sec.

*The Camera Club, Charing Cross Road, W.C., June 20th.*

### GLASGOW INTERNATIONAL EXHIBITION.

Sir,—I have pleasure in announcing that the following gentlemen have kindly consented to act as judges at the exhibition (there are three photographers and two painters), namely, Messrs. Valentine Blanchard, Adam Diston, Richard Keene, Francis Powell (Pres. R.S.W.), and William Youug (R.S.W.) I hope shortly to name two gentlemen, with a special knowledge of photo-mechanical work, who will assist the others in that section.

There is a slight error in our prospectus, which may lead to some misunderstanding. In the clauses at the head of the list of classes, "Class 24 (Scientific) may be &c.," should read "Class 25 (Scientific) may be, &c."

I beg to confirm the arrangement already announced by the Cardiff executive, whereby pictures entered for both exhibitions can be sent on here, carriage paid.

Wm. Goodwin, Hon. Sec.

3, *Lynedoch Street, Glasgow, June 18th.*

### "NOTES ON PERSPECTIVE DRAWING AND VISION."

Sir,—The dovecotes of Charing Cross Road have been fluttered; there is no use denying the fact. The god of art (lately arisen) has repudiated his prophets, trumpeting their falseness, denying them fire; aud the worst feature of the whole matter is that this perverse deity is undoubtedly clever, which the prophets are not. *Le bête de bon Dieu* on their tongues, dismay in their hearts. This is the state of affairs when the last thunderbolt is still poised.

"The deathblow to all the artistic pretensions of photography," is entitled "Notes on Perspective Drawing and Vision," by Dr. P. H. Emerson and T. F. Goodall. The share that each has had in the work is, perhaps advisedly, left vague, and a pleasing sense of irresponsibility must fill the breasts of both gentlemen. It is priced at sixpence—surely a moderate figure for such sensational research—and coutains six and a half pages of matter divided into preface, propositions, proofs, and deductions. If what is said in it be true, the "amateur-trade" will be busy repainting their signboards. I write this to save them premature expense in investing in a paint pot. In the end we all have their interests at heart, for without them it would be like unto a world without Pears' soap. Such is the value of advertisement!

Having thus duly set forth my charitable disposition, and explained this intrusiou, I desire to disclaim any attempt to offend the authors of this "bolt from the blue." I propose now to run through these six and a half pages, making a few simple comments, and asking several common-sense questions.

"Proposition A" strikes the keynote of the argument by stating that we see objects on a larger scale with that portion of the eye (the upper portion) which perceives distance, than with that portion which views foreground (the lower portion); and that, on the other hand, the lower portion of the eye sees a larger arc than the upper.

I would ask whether physiology bears this out?

I cannot test my field of vision by lying on my back, as I am at present in London, and there is hardly any other body of men on the face of the earth more unscientific and unsympathetic than the metropolitan police. I have also been unable to test the powers of my eyes between my legs. Samaritan-minded strangers might think me in pain. I regretfully decline to deceive the simple-minded. I therefore pass on to "proposition B."

If any question of the "strug. for life," as the French have it, is involved, surely Dr. Emerson (I omit Mr. Goodall's name for brevity) should not draw his arguments from the habits of such remote periods. We do not, now-a-days, scan the horizon until our eyes bulge. Residence in towns must long ago have corrected this painful state of things.

The attempt to see all "objects near to us and close around clearly" would surely result in magnifying them, and this in itself would prevent the "compassing of as wide a field as possible." We cannot have it in meal and in malt. Again, is it not only that which we are trying to see which materially affects the eye? We do not focus distance and foreground at the same time. Therefore, if we look at one, we are not affected by the other, and no amount of straining the eye will get over the difficulty. To suit Dr. Emerson's theory, I take it, we should have to focus the eye on both foreground and distance at once, and, while straining to see the "objects near us clearly" with the lower part of the eye, should have to "try and draw distant objects nearer, and to enlarge them" with the upper portion. My experience teaches me that this is impossible; but, supposing Dr. Emerson says, "No, I let my eye rest on that which attracts it, and, keeping that in focus, only know the remainder by suggestion." Under these conditions, the distance is magnified at the expense of the foreground, and differs in that respect from its photographic reproduction.

In this case, I stand on even firmer ground, for, knowing that there is only one point in focus, both foreground and background must be out of focus. Now, it is easily demonstrated on the focussing screen—at least, such is my experience—that objects thrown out of focus one way or the other appear larger than when in focus—"loom" is the word—and that, under these circumstances, not only would the image of the distance be larger, but that of the foreground would be so too. This does not appear so to the eye, I take it, because of the greater luminosity of the distance, which practically overawes the foreground, much as the effect called halation enlarges our windows on sunny days. Now this enlargement of the distance, when out of focus, can be produced photographically, as Dr. Emerson's plates themselves show.

Further, the whole of Dr. Emerson's theory presupposes that all human beings are accustomed to see distance frequently. Since the existence of large towns, I venture to assert that the majority of people seldom have that opportunity, and, consequently, we are in this dilemma: either the countryman on coming to town finds part of his eyes unserviceable, or the townsman on going into the country cannot see distance as he ought to. Now, if this were the case, we should have heard of eye troubles whenever people change their surroundings; but I, for my part, have never heard of them as yet. Furthermore, do artists who live in town recognise the damage they are doing to their sense of æsthetic appreciation? And are townsmen less keen-sighted than countrymen?

I therefore venture to submit that Dr. Emerson's explanations of his theory fail; and, more than this, these considerations throw great doubt upon the whole of his case; for I would ask him, with all respect, as we can only focus a very small area at once, and as, in order to do this, the eye must be directed towards it, how he localises the different portions of the retina which receive the impressions of near objects and those more remote. Does he mean to say that when I look at my feet I use a certain portion of my eye, and when I look at the mountains a certain other portion? When we look at a landscape we only grasp its beauty by a succession of rapid glances at its component parts, and this theory implies that my eye in those glances selects the distance and magnifies it at the expense of the foreground. All this sounds very improbable, but I write under correction.

Dr. Emerson now goes on to give his experiences in support of his contention. His first proof has to do with a tall chimney, at the centre of which he looks steadily from a point distant by its height. He says that the top appears wider than it really is in relation to the width of the base. Supposing for the moment that this is so, and that he has succeeded in getting all the chimney in focus. Now, by letting the eye gradually sink to the ground (not "measuring or correcting") the region where expansion appears to set in will also sink gradually, just as if it were a snake standing on tip tail swallowing a mouse whole. All I have to say to Dr. Emerson in this case is to advise him to go at once to a good oculist and have his eyes attended to. If you view the world through bad window panes, you naturally fall into error. What Bacon wrote in the early part of the seventeenth century appears to apply in more than one way to Dr. Emerson at the end of the nineteenth:—"Idols of the den are the idols of every man in particular, for, besides the general aberration of human nature, we every one of us have our particular den or cavern which refracts and corrupts the light of nature, either because every man has his respective temper, education, acquaintance, course of reading, and authorities, or because of the differences of impressions as they happen in a mind prejudiced or prepossessed, or in one that is calm and equal." (*Novum Organum*, translation of Dr. Shaw, 1813.)

Dr. Emerson refers to the Parthenon in support of his argument. I have a photograph of that edifice before me as I write. The columns, even in this photograph, appear parallel to the eye, though by measurement they are not so. Thus, Dr. Emerson will see that the much-abused lens is capable of giving an effect he can only credit to an alleged abnormal condition of the eyesight. Again, *if this photograph be turned upside down, the columns still appear parallel to one another*, with disastrous consequences to his theory. I venture to suggest to Dr. Emerson that, such being the case, the reason why this happens lies in the fact that we are here dealing with what is called an optical illusion, and depends entirely on the proportion and position of the parts of the building itself. Such also are his own experiments with pieces of paper, and, being so, are fitter to help to sell a brand of soap than to convince rational beings.

So far as regards his experiment with a door, I have been looking at one for two days in the manner he directs, but cannot perceive that the top is larger than the bottom. If I did, I should bear in mind the story of the lion on Northumberland House. The crowd saw its tail wag as soon as they were asked to do so.

I have also tried to induce myself to believe that the halfpenny is nearly as big as the penny under the conditions described by Dr. Emerson; but either from early training, intense honesty, commercial instinct, or my short sight, I have not been able to effect my purpose.

I do not, sir, want to trouble you with diagrams, but surely Dr. Emerson's remarks about the lateral angle subtended by a book at six feet from the eyes when viewed by one or both eyes, have a simple geometrical explanation. The error introduced by binocular vision can have but an infinitesimal effect on the sense of height and breadth, the power being almost wholly spent in giving stereoscopic effect or sense of depth.

I believe that I have now, roughly speaking, traversed the whole of Dr. Emerson's ground, and, in conclusion, I would offer a few remarks of my own as to the reason why distance usually appears dwarfed in photographs, as this is, no doubt, what first set Dr. Emerson a-thinking. Distance is, of course, most obvious to us in the case of hills, and it is to these that I now refer.

The question of lenses apart, I cannot help thinking that the true explanation of this curious effect lies in the fact that the eye receives the visual rays, the sensitive plate the chemical rays. Now, mountains attract moisture, and, generally speaking, we look through a screen of moisture—perhaps invisible, but for that reason none the less present—when we look across country. Thus, the eye viewing distant mountains, sees through a screen of more or less moist air, which causes the mountains to "loom" to the eye, as certainly as though they were seen through mist. The chemical rays are not, however, so much affected by this screen, and the mountains appear on the plate in their true proportions. I suggested to a friend an easy test, and Mr. Sutcliffe since writes me that the experiment has been tried. The test is this:—Choose a clear day, and select a view with prominent mountain masses in the distance. Take a large camera and a long focus lens (this for obvious reasons). Now focus on the distance, and, with a fine pencil or crowquill, trace on the reversed ground glass the apparent outline of these mountains, being careful to mark a base line and a few salient points, to obtain register. Without disturbing the camera, but allowing for the focus of the plate, take a sharp negative and see if the two coincide. The result, which I did not know at the time, but which I rightly anticipated, is that the image on the ground-glass—in other words, the visual image—is slightly larger than the image on the plate, or chemical image, and this being so, we have a very simple solution of Dr. Emerson's puzzle. It should also be borne in mind that the brighter colours of nature will always make objects appear larger than their commensurate monochromatic reproductions, and this applies to drawing and painting as well as photography.

It seems to me quite absurd that what is really an excellence of the photographic art—an excellence unattainable in painting or drawing—should be treated as a reason of exclusion from art altogether. Every art has its qualities, and one of the qualities of photography is exactitude. From what I have said it will be seen that the human eye would estimate the size of mountains according to the amount of moisture in the intervening air; in other words, it would hardly ever estimate their height twice alike. Photography, on the other hand, is practically absolute in its estimate. Surely there can be no two ways of thinking about it. But again, I say, I write under correction.

If, in this rather long letter, the temperature has at any time risen above summer heat, I must beg of you, sir, to attribute it to no want of regard for Dr. Emerson, but rather to advocacy of the amateur trader whose business is endangered. And I would put it to the person, who keeps what they call their conscience (but whose name I, at present, abstain from mentioning), whether a notice-board was not in preparation marked "Closed for Repairs," which would shortly have been dangled prominently in the thoroughfare. If I have, in any degree, saved this expense and averted a stoppage of business, I feel sure Dr. Emerson will join me in whitewashing the method employed. Dr. Emerson is a good and clever gentleman—it is something to be good, and clever, and a gentleman after all, particularly in photography—but, in this case, I submit he has presumed a little too much on his undoubtedly admirable abilities. W. A. Boord.

*June 23rd.*

HOLIDAY HOMES.

Sir,—As any readers of the Photographic News who are familar with the offices of this Union, and the walls of its 200 centres will admit, we have been liberal patrons of photography; we now write your readers to help us. The object of our Holiday Homes is a fortnightly holiday in the country for the poor children attending our schools and mission. The homes are situate at Folkstone, Chislehurst, Thursley Common, East Grinstead, Caterham, Pilsea, and Windsor. I mention this in case, for their own purposes, any of your readers may wish to photograph groups of the children. The cost per head for the holiday is 10s., not a large sum, and easy to make up among a circle of friends. Those who prefer to send smaller or larger offerings are invited to do so. Above all, we wish no one to think his or her offering would be *too* small. Trifles total up grandly. John Kirk, Secretary.

*Holiday Homes Fund, Ragged School Union, Exeter Hall, Strand, London, W.C.*

Messrs. Marion & Co. inform us that during their last stock taking they determined to dispose of a large accumulation of surplus stock, and with this view have fixed July 6th as the date for a clearance sale. The stock referred to comprises cameras (ordinary and detective), stands, lenses of all kinds, backgrounds, and a number of articles gleaned from all departments of too varied a nature to particularise. The goods are to be marked at absurd figures, which means that they will be sold at considerably under cost price.

## Proceedings of Societies.

Photographic Society of Great Britain.

At the technical meeting of this Society held on the 23rd inst. the chair was occupied by Mr. W. Bedford.

A short paper sent by Mr. Birt Acres was read, introducing the subject of the discussion of the evening, Orthochromatic Photography. The author of the paper complained of the apathy generally shown to orthochromatic photography. This apathy he attributed to the idea that the use of a yellow screen was a necessity. He maintained that a screen was not necessary, and the idea that it was so was a bogey. In describing the use of the coloured screen, he said that he had found the best to be those of optically worked glass sold by B. J. Edwards and Co.

Mr. J. Traill Taylor said that screens of coloured glass ground and polished for orthochromatic work were introduced some time since by Mr. Gotz, and did not originate, as might be inferred from the paper, with the firm with which Mr. Birt Acres was connected.

Mr. A. Mackie said that Mr. J. B. B. Wellington had, in 1887, recommended the use of patent plate glass coated with stained collodion. The collodion side was cemented to another glass with Canada balsam, as suggested by Mr. Debenham, so that externally there were the plain glass surfaces, and the collodion was preserved from injury. He could not agree with Mr. Acres that the use of orthochromatic plates without a screen was sufficient.

The Chairman said he thought there was prejudice in the statements of the makers of orthochromatic plates, that they would give satisfactory results without the use of a screen in addition. Nothing like a correct orthochromatic effect could be produced without a colour screen. He had hoped to have a discussion on various methods of preparing orthochromatic plates. He had brought specimens of dyes of various kinds, and, with the spectroscope, their absorption could be examined. He would advise the study of Vogel's researches, which were amongst the classics of photography. Amongst the dyes he had brought were cyanine, methyl-violet, turmeric, and erythrosine. To make an orthochromatic emulsion, it sufficed to put in a small quantity of the dye in the course of manufacture. He preferred to use the dye in the bromide solution, so that the formation of the compound of silver went on simultaneously with that of the silver bromide. Erythrosine gave an emulsion the general sensitiveness of which was greater than that with other dyes, and therefore, on the whole, he preferred it, although its orthochromatising power was not so good as methyl-violet or cyanine. Erythrosine sensitised strongly for yellow and green, but not at all for red; in fact, it was rather detrimental to most reds. For ordinary work, one of the best dyes was methyl-violet. There was no necessity for using ammonia with erythrosine; the statement that it was necessary was a mistake.

Col. Waterhouse said that he had used ammonia generally, and had thought that, on the whole, it was better to do so. He had not, however, sensitised the emulsion direct, but had bathed commercial plates in a solution of the dye. In India, where he worked, it was not easy to manage the manufacture of gelatine emulsions, and he simply sensitised plates sent over from England. He used erythrosine silver, and found that plates would keep fairly well; at all events, he had found no change after two months' keeping in a very trying climate.

The Chairman thought that it would be of interest to know why it was that gelatine did not lend itself so well to orthochromatic sensitising as collodion.

Mr. Addenbrooke could quite support what had been said as to the uselessness of orthochromatic plates without a yellow screen. With an orthochromatic plate, yellow did show slightly better than on an ordinary plate, both used without screens; but the difference was exceedingly slight—scarcely perceptible.

The Chairman said that it could be told, during the preparation of the emulsion, whether the dye added to it would have orthochromatising effect or not. If, on washing the emulsion, the colour of the dye disappeared, there would be no orthochromatic effect; if the emulsion retained the colour after washing, there was a combination which would be effective.

Mr. J. R. Gotz showed samples of yellow and orange glass made very thin and polished for use as colour screens. He supplied these for use in the place of the metal diaphragm. A convenient form was to cut a strip long enough to serve for two diaphragms. A piece of opaque paper was pasted on the glass, and openings cut (one at either end) of the sizes for which it was desired to have the openings in the diaphragm. With regard to the use of orthochromatic plates with or without a screen, that was a matter for discretion, according to the circumstances. For natural objects generally a screen was not necessary. Many examples were shown, and of some groups of flowers he said that the screen caused the yellow and orange to come too light, almost white. For such a subject it was better not to use the screen. Water-colour drawings, too, did not generally require a screen. With oil paintings it was quite different, and here the use of a screen was a necessity. A number of negatives and prints of various coloured subjects, and in one case the original (an oil painting), were shown, and the effect of orthochromatic plates with and without screens was pointed out. The plates used were Obernetter's, and the orthochromatising was accomplished with eoside of silver and cyanine.

Col. Waterhouse had used Gotz's colour screens with very good results. He showed photographs taken with them. Amongst these were some in which pencil drawings and pictures on varying tints of paper were photographed simultaneously, and all came out well. He had also used screens made of mica, and varnished with a deep yellow varnish. As the aniline dyes were very insoluble in benzole (the menstruum used), he had dissolved turmeric and annatto to colour the screen.

Mr. A. Pringle said that Mr. Birt Acres attributed the apathy of photographers to orthochromatic work to what he called the yellow screen bogey. He did not believe that anyone had been deterred by the necessity for using a screen. It was not the objection to a yellow screen, but the restrictions that had, by a patent, been put upon orthochromatic photography that was the cause of what apathy existed. This cause had undoubtedly, to a great extent, restricted British investigation. Three years since he had made a large number of experiments, comparing ordinary plates, with and without a screen, with commercial orthochromatic plates, and with plates sensitised by himself with alkaline erythrosine B. He had a series of nearly a hundred of these results at the Camera Club, and the opinion of the members was that of those used without a screen there was no difference between the ordinary and the orthochromatised plates. His own opinion was that there was a slight difference, but so slight as to be almost imperceptible. He entirely disagreed from Mr. Birt Acres' statement that there was no necessity to use a screen with orthochromatic plates.

Mr. Mackie agreed that the apathy of photographers to orthochromatic processes was not due to any yellow screen bogey, but he attributed it to the fact that, in England, orthochromatic plates were manufactured by one firm only. Why should this be? It had been shown over and over again that the one point in the patent—the use of ammonia with the dye—was not a necessity.

Mr. Chapman Jones considered that instead of showing reproductions of pictures, it would be better to photograph even tints of various colours; these could be more readily and exactly compared.

Mr. Gotz said that there were circumstances in which the use of a colour screen was necessary, and other circumstances when it was not so. Towards evening, when the light became yellow, nature supplied the screen, and no other was required. He had found it possible to photograph and get good results much later in the day with orthochromatic than with ordinary plates.

Mr. A. Lawrence (the assist. sec.) showed a series of tints painted on card, each tint in a number of gradations. He also showed negatives taken from this series with and without screens, and on plates variously sensitised. Methyl-violet and cyanine proved particularly effective. One plate was prepared with a chemical sensitiser, not a dye. In another case, potassium nitrite was used in conjunction with a dye.

Col. Waterhouse showed some further experiments with the reversal process. He now used thiocarbamide, which he found rather better than thiosinamine. The developer was made up of eikonogen and carbonate of lithia, one per cent. each, sulphite of soda two per cent., and five drops of a solution of thiocarbamide and ammonium bromide in alcohol were added to each ounce. He noted also that when a film spread on silver and exposed to light, and another film not exposed, were coupled and placed in the developer, an electrical current passed in the contrary direction when thiocarbamide had been added to that which passed in the plain developer.

The Chairman proposed thanks to those who had contributed to the work of the evening, which were passed, and the meeting closed.

---

### Holborn Camera Club.

*June 19th.*—Mr. E. H. Bayston in the chair.

Mr. Frederick J. Cobb demonstrated first on silver printing. He gave a short history of the process, which he thought was the most popular among amateurs, although of late years the numerous processes which had been introduced had tended to a certain extent to decrease its popularity. He gave a few hints on keeping the paper, which, he said, would keep for a considerable time. Even after printing, if the print was well washed, it would keep for an indefinite period. He always used the acetate toning bath, which was, in his opinion, the best that could be used. An old bath would work much better than a new one. He toned a few prints with the acetate bath, which worked exceedingly well.

Mr. A. J. Golding then demonstrated on gelatino-chloride of silver emulsion paper. The extreme simplicity of the working of this paper recommended itself to all amateurs. He had never met with any great success in ordinary silver printing, but he had obtained, without any trouble, excellent results on this paper. The depth of printing depended to a great extent upon the method of finishing the print. If it was finished with a matt surface it need not be printed so deep as if it was to be enamelled. After printing, the prints should be well washed and placed in a 10 per cent. solution of chrome alum to harden the film. The time the print should be left in the bath depended upon the temperature—the warmer the air, the more time it should be left in the bath. He used the following toning bath: Dissolve $2\frac{1}{2}$ drams of sulphocyanide of ammonium in 16 ozs. of water, and one day before it was intended to use the bath add 3 drams of a 15 dram gold solution. He believed in quick toning, because they were dealing with a delicate surface, which would not stand much handling. The richness of the tone depended upon the amount of sulphocyanide of ammonium in the bath. The fixing bath was 2 ozs. of hypo to 20 ozs. of water, leaving the prints in about ten minutes. He had not noticed any loss of tone while in the fixing bath. With regard to the final washing, he thought two hours would be sufficient. In his opinion the prints did not require so much washing as ordinary silver printing, because the hypo was on the surface, and not soaked in the albumen. The print could be finished with a matt surface or enamel, by using plate glass for the latter, or ground glass for the former. The glass, after being thoroughly cleaned, was dusted with talc, and the print squeegeed down, and peeled off when dry. Starch was the best mountant. If the print was finished with an enamel surface, mounting was exceedingly difficult. The prints, after being squeegeed down, should be backed with a piece of waterproof paper, which came off with the print, and prevented the moisture from the mountant going through the paper and affecting the enamel surface of the paper. He then toned and fixed some prints on Obernetter and Liesegang's aristotype, together with one which had been printed some twelve months ago on Fallowfield's paper, all turning out splendid. This he followed up by finishing off some prints with a matt surface.

The Chairman said he had tried both processes. With regard to preserving silver paper, an old piece of sensitised paper placed with the other paper was an excellent preservative. When squeegeeing down an aristotype print on to glass, a great difficulty was to get rid of air-bubbles. He had found that if a pool of water was left on the glass, and the print was placed in the pool, no air-bubbles would result.

Mr. Herbert Thompson said he could quite concur in Mr. Golding's remarks on the simplicity of the working of the paper over ordinary silver paper. He did not recommend the use of chrome alum, but ordinary alum, as the former was liable to give a green colour to the whites. With regard to washing, he thought aristotype prints would require more than ordinary silver prints, as hypo, in his opinion, seemed to cling most tenaciously to gelatine.

Mr. G. Luxton said the best way of thoroughly cleaning glass plates was to use the following: Photographic tripoli, methylated spirits, and water. The quantity of each could easily be ascertained.

Mr. A. G. Golding said, with regard to air-bubbles, if after the print had been peeled from the glass it was found that air-bubbles had been present, the print could be washed in water and squeegeed down on the glass again.

### Glenalmond Photographic Club.

At the fortnightly meeting, the president in the chair, it was decided that the photographs for the two competitions which the Club have now on hand should be sent in by July 11th.

Mr. Craig initiated a discussion as to the position of the Club, and it was generally agreed that it manifested an increase of energy.

The President then showed a new travelling lamp, and Mr. Johnstone an Eclipse hand-camera, after which the meeting became general to inspect some photographs produced by the president and Mr. Johnstone.

### Lowestoft and District Photographic Society.

A meeting was held last Friday at the School of Science and Art, Regent Road, Mr. W. Stringfield presiding.

After the election of members, several topics arose for discussion, among them that of development, and it seemed to be the general opinion that pyro and ammonia afforded the best results. Some few supported hydroquinone, but admitted that negatives produced thereby did not print so satisfactorily. Several prints and negatives were passed round for inspection, after which a few nice lantern slides, principally interiors, were shown.

Cutting Glass Tubes, Bottles, etc.—Have some strips of thick blotting-paper at hand, from a quarter to half an inch in width, and of different lengths. Two pieces of such paper are wetted and wrapped around the bottle, tube, or other vessel to be cut, once or oftener (once is sufficient). These pieces of paper, cut true, are wrapped around the vessel like two bands. They must not be placed too close together—say from a quarter to three-eighths of an inch apart for larger vessels, and rather less than a quarter of an inch apart for tubes of an inch in diameter. When this is arranged, a fine flame about two or three inches long is allowed to play on the glass between the two pieces of wet paper, the vessel being slowly revolved, and the point of the flame kept between the two papers. Within a minute, usually, the vessel separates with a clean cut along the line against which the flame played.—After *Chem. and Drugg.*

Blue Prints.—In a communication to the *Engineering News*, Mr. F. H. Latimer states that he has found that adding oxalic acid to the ordinary blue print mixture materially lessened the necessary time of exposure. The solutions used were:—(1) Ammonio-citrate of iron, 120 grains; water, 1 fluid ounce; to which is added a few drops of strong ammonia solution till the odour is quite perceptible. (2) Potassium ferricyanide, 105 grains; water, 1 fluid ounce. (3) Saturated solution of oxalic acid. Equal quantities of the first two solutions were mixed together, and to 10 parts of this mixture from 1 to 3 parts of the oxalic acid solution are added just before use, with the result that in cloudy weather the solution containing three parts of oxalic acid prints about ten times as quickly as the pure solution. For ordinary purposes, however, it is better not to add more than 20 per cent. of the oxalic acid solution, or difficulty will be found in getting the lines to wash white.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

Photargus.—*Cutting Board.* The rule to which you doubtless refer is that of taking the diagonals, and *where they cross* must be the exact centre of the glass. Another good plan would be to take and fold a piece of paper cut to the same dimensions as the glass; then use this as a guide to bisect the plate. Mr. Alexander Cowan showed an ingenious cutting board many years ago at one of the technical meetings of the Photographic Society. *Black Specks in Albumenised Paper and Prints.*—Without seeing them, it is so difficult to offer an authoritative opinion. They may arise from ultramarine or metallic particles in the paper, or accidental stains from minute traces of pyro, hypo, or other chemical impurity. The mere weighing out of pyro in the same room during warm weather has been known to produce a plentiful crop of black specks upon paper which was previously quite free from them. The brand you mention is one of those usually held to be thoroughly trustworthy.

M. B.—*Hand Camera Practice.* There is no question about the several movements requiring to be frequently rehearsed as with any kind of manual drill, and you may as well do this with dummies or spoilt plates. Remember to close the sliding front before setting the instantaneous shutter, and adjust the focus as nearly as you can by estimating the distance. Provided the first plate is set fairly in the notch, there should be no possibility of fouling or jamming, as all the rest follow suit and drop down in succession.

Shrewsbury.—*Actinometers.* Since writing to you last week, we found the description (occupying two pages, with explanatory drawings) in the *Journal of the Society of Chemical Industry* for May, 1890. It took the form of a communication to the Liverpool Section, and was read immediately after Messrs. Hurter and Driffield's paper. The instrument is confessedly based upon Mr. Warnerke's earlier luminous paint actinometer, but with sufficient difference in the mode of working to constitute a valid patent claim.

Topo.—*The Chromotypic Specimens.* On Tuesday next, 30th inst., they will be taken down and returned to their owners. Meanwhile they can be seen, from 2 p.m. till dusk daily, at 50, Great Russell Street (third floor), on presenting your address card.

G. J. F.—*For Enamels.* Either Mr. C. A. Rudowsky, 3, Guildhall Chambers, E.C.; or Messrs. Sharpus, McCullum, and Co., Cockspur Street, Charing Cross.

H. T.—*The Proposed National Gallery of British Art.* The terms of Mr. Henry Tate's munificent offer will be found in the *Society of Arts Journal* exactly twelve months ago; or in the *Times* of Saturday, 21st of June, 1890.

L. E. (Southport).—*Terms of Sale.* Any good business ought to be cheap at the price of one year's average takings; but does this include a fair stock of apparatus and requisites? At first blush it seems reasonable; but one ought to take a professional opinion unless you know the locality well yourself.

C. J. S.—Messrs. Morgan and Kidd offer to do the kind of work about which you are enquiring. See their catalogue, page 16.

F. V.—Thanks for letter duly received. We hope to hear again from you shortly.

A. W. W. and Co.—Answered by post, and further information will follow as soon as procured.

Emily.—*Dark Room Lamp.* A good plan is to use above the ruby light a yellow screen, kept covered during the progress of development, but, by raising a curtain in front, permits of examining the negative by its aid, when it is safe to do so.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1713.—*July* 3, 1891.


CONTENTS.



## BURNT-IN PHOTOGRAPHIC TRANSPARENCIES.

Before us, as we write, are a number of specimens of photographic transparencies on glass, which have been produced by a new process which has been perfected after five years of incessant work by Messrs. Oeffelein and Co., of 54, Berners Street, Oxford Street. It is easy to see at a glance that no photographic film rests upon the glass, and that the pictures form part and parcel of the material itself. If, with the corner of another plate, we endeavour to scratch the surface, we quite fail in doing so, although a powdery mark is, for the moment, left behind by attrition from the point of glass employed. The photographs are burnt-in to the glass, and are presumably as imperishable as the substance of which they form part. They are of different colours—blue, red, orange, mauve, &c.—and the inventors state that they soon hope to have at their command in the production of these pictures all the varied tints which the richest palette can offer. Some of the work has a coarse grain which gives the softening effect of a stipple, and some is as fine in texture as a skilfully made lantern slide on a gelatine plate. It is thus within the power of the operator to produce fine or coarse work at discretion, and according to the use for which the pictures are destined.

Within the past few years, coloured glass has been largely used for domestic decorative purposes, and there are very few who do not know what material is meant by the term "cathedral glass." By means of Messrs. Oeffelein's new application of photography, this method of decoration is sure to receive a fresh impetus, for by it it will be possible to invest such decoration with an interest which it never before possessed. The life-sized heads taken direct which have formed such a constant feature of recent exhibitions can now be produced in imperishable material, and can be used in windows, fire-screens, lamps, and for other purposes where glass can be employed decoratively. We are not quite certain whether portraits of this kind would be admissible in church windows, but we think that a memorial window might well contain the portrait of the person honoured, inserted, of course, in a manner which would not be obtrusive. A photograph of a nineteenth century man or woman got up to look like a saint would most likely border on the ludicrous. There was a fearful example of this sort of thing shown in the shop windows only a few years ago, at the expense of good Mr. Spurgeon, who was pictured in full armour as *Christian* in the "Pilgrim's Progress." The picture was not an artistic success.

But, of course, the main use of Messrs. Oeffelein's burnt-in photographs will be for secular decorative purposes, and here it has a very wide field of application. Witness the good effect obtained by the use of stained glass in the dining and refreshment rooms at South Kensington Museum. Here we have ornament relieved by apt quotations from many authors upon the subject of the pleasures of the table. How well these burnt-in photographs taken from suitable models would come in here. But we are by no means confined to portraiture, although the specimens before us happen all to be of that nature. Studies of fruit and flowers will be available, and naturally the copies of well-known works of art can be reproduced in this imperishable form. The portraits of favourite animals—dogs, cats, and horses—will also commend themselves as good subjects for such treatment; indeed, the possibilities before this new application of our art are most extensive.

Another use which may be found for this photographic vitrification is the production of lantern slides which will need no mounting or cover glasses. We are not sure whether the production of a picture of this kind on glass suitably thin will not present some difficulty in the annealing operation, but of this we have no certain knowledge. It is also certain that in the case of a negative of great value—such as that of a royal personage, or a public character whose pictures sell well—the new process will be employed for the purpose of duplication in permanent form.

We are not able to furnish details of the method employed, nor will those who desire to know all about it be able to assuage their curiosity by a visit to the Patent Office; for Messrs. Oeffelein have determined to keep their invention unpatented—a course which we think is wise in the case of a process which has cost many years to bring to perfection.

## PHOTOGRAPHIC PERSPECTIVE.*

Chiefly in Reply to Messrs. Emerson and Goodall.

BY W. E. DEBENHAM.

Under the title of "Notes on Perspective Drawing and Vision," Dr. P. H. Emerson and Mr. T. F. Goodall have just published a series of "propositions, experiments, proofs, and deductions," by which they claim to show that, for "scientific reasons," the accepted rules of monocular perspective are likely to mislead, and to prove the fallacy of photographic and all mechanical methods of measurement.

When it is attempted to be shown that accepted rules are wrong for "scientific reasons," we have a right to ask that the proofs by which it is claimed that the overthrow of these rules is accomplished shall be of as exact and definite a character as the cirumstances permit. I think it may be shown that the so-called proofs submitted are of so loose and indefinite a character as not to constitute proofs at all.

The first part of Proposition A sets out with a statement—which they do not support by any anatomical reasons—that objects seen below (which are here assumed to be foreground objects) are seen on a smaller scale than those which are above, and are assumed to be distant. That is (say the authors), "a perspective drawing surprises us by making the foreground objects look larger in proportion to the distance." It is added that we see a larger arc with the lower half of the eye than with the upper.

The second proposition, as to width of included angle, has nothing to do with the first, as to the relative sizes of upper to lower objects, and it is confusing to have the two placed in one proposition. The second one may, however, be disposed of at once by the fact that it has no bearing on perspective, or, generally speaking, even upon the amount of field included in a photographic view. The angle of view seen by the eye is considerably in excess of 45°, both above and below a horizontal axial line. I mention this angle because it represents the view on a photographic plate which is twice the height of the focal length of lens. It is evident that so long as the boundary of the field of vision is greater than that included on the photographic plate, any greater extension of the boundary in one or other direction has nothing to do with the photographic representation. What occurs within the limits of the photographic view is not affected in position by a variation in the limit of vision outside the area.

The "proof" is said to be "completed when we stand with our legs apart, and, standing with our back to the landscape, bend down and look between our legs. Here the fields are inverted, and consequently the distance appears small and far off," &c.

The effect on the disposition of the foreground obtained by choosing a lower point of sight, as by lowering the camera, is well known, and this, together with the confusion arising from seeing things in an unusual position, and perhaps from the rush of blood to the head, seems to afford a more rational explanation of real or fancied differences of aspect than the assumption of different proportions being rendered by the upper and lower halves of the retina.

Proposition B, assuming Proposition A to be established, attributes the result to the naturally selective action of the retinal nerves, and suggests that special functions have been developed by natural selection for the purpose of drawing distant objects nearer. Further on, in Proof 3, we gather that the amount of difference of size, as seen at an angle of 26° 26′ above and below the axial line respectively, is estimated at one-sixteenth of the total. Objects at these distances from the axis are considerably removed from the region of really distinct vision, and it is only objects much nearer to the axis that can be minutely examined, and, consequently, if any difference of scale were proved or admitted, the proportionate difference at such smaller angle would be much less than that at the larger one. Taking the estimate, however, at the angle given, the difference between fifteen and sixteen is so little that there are few, if any, occasions where an object distinguishable on the one scale would be noticeably less so on the other. The deduction, "that mathematical perspective gives quite a false impression of what we see when using either one of our eyes, or both," is supported by "proofs" of the same loose and inexact character as those given under Proposition A. The first three deal with a statement that objects having vertical sides appear wider at the top than the bottom. Proof 2 is that which is most easily tried, and, according to this, if we "look at the middle of a doorway or door, it will be felt that the door or doorway is wider at the top than at the bottom." Now, to an observer standing, the middle of an ordinary door is considerably below the height of the eye, and the line of vision will be directed downwards. The top of the door will, therefore, with regard to the axis of the eye, be in a plane in advance of the lower part, and will, consequently, appear to be larger. If the observer is seated at such a height as for the eye to be level with the centre of the door, and then that is looked at so that the line of vision is at a right angle to its surface, the top no longer appears broader than the bottom; at least, it does not to me, or to anyone else with whom I have compared notes.

Proof 3 directs us to cut two slips of paper 8 inches long, one 2 inches wide at each end, and the other slightly tapering, *i.e.*, from 2 inches to $1\frac{7}{8}$ inches. It is asserted that if both are held at a distance of 8 inches from the centre of the eye, and looked at directly, the parallel piece will appear to be wider at top than bottom, and the tapering piece, if held with narrow end uppermost, will appear parallel. This is the sort of experiment with which anyone may easily deceive himself. A strip of paper does not readily maintain a strictly vertical position, or remain in one true plane. For the experiment to have any value, the material should be capable of being maintained in one unchanging position, and means—not indicated by the authors—taken for truly fixing its height and the position of the eye. Even then the indistinctness of vision over all but a small area near the axis of the eye is so great that if, as required by the proposition, the direction of the eye is not moved up or down, the extremities of the paper will be so much blurred that a little difference of width could probably not be distinguished at all, but a person having an expectancy of seeing either equality or difference could easily imagine that he did so see it.

According to Proof 4, a penny is to be placed "upright on a table, and a halfpenny eighteen inches behind it, and a little to the right or left of the penny. The eye must look over the penny, and at the halfpenny, so that the penny is a foreground object, and the halfpenny a distant object. If the observer now looks steadily at the halfpenny, at the same time seeing the penny, he will find the impression given is that the halfpenny looks nearly as large as the penny."

* A communication to the London and Provincial Photographic Association.

This "proof," like the others, is exceedingly loose and inexact. We are not told at what distance the eye is to be placed, or at what height above the level of the table. As a matter of fact, if the position of the eye is such that the coins come near together in the field of vision, there is no doubt about it their relative proportions are seen, and the smaller coin does not appear relatively larger than it really is. When the level of the eye is much raised, so that the penny is not near enough for comparison, and when it comes far from the limit of distinct vision, it is easy to assume disproportionateness. If, now, the first and leading proposition of Messrs. Emerson and Goodall is a true one, the object seen on the upper part of the retina—the lower half of the eye, they call it—appears smaller in scale than those projected on the lower half, and the penny, on this account, seems smaller than it really is. Then, if the image of the penny is made to fall on the lower half of the retina, by making it a *raised* foreground object, it should appear as much larger in the second case as it did smaller in the first. It seems strange that the authors of the paper under discussion should not have thought it worth while to make this experiment, which is simply the complement of the other. I have here an appliance with which it can be done. There is a horizontal bar lying on the table, fitted with three vertical arms. From the vertical arm at one end of the horizontal bar a halfpenny projects. At a distance of eighteen inches in front is a second vertical arm, with niches in which pennies are fitted above and below the height of the halfpenny. Eighteen inches, again, in front of this is the third vertical arm, in which an eye-hole is bored, level with the halfpenny. A large sheet of white card is placed behind, so that we are not confused by seeing different backgrounds to the different coins. If the halfpenny is looked at direct, I cannot find that the one penny appears to differ from the other in size, nor has anyone else to whom I have shown it found it to be the case.

It may seem to some to be a waste of time to fit up even such an appliance, and it certainly might rather be expected that Messrs. Emerson and Goodall would have done it themselves before announcing their propositions; but, when it is remembered how many people were mystified by the quasi-scientific theories put forward not long since on the subject of definition or focussing, it may not be wasted time after all.

It is remarkable that Messrs. Emerson and Goodall deal with near objects only as below, and distant objects as above. The experiment with the two pennies shows the near object both as above and below. If their proposition is true, that the lower half of the eye sees things on a smaller scale than the upper, and for this reason a perspective drawing surprises us by making the foreground objects look large, then such foreground objects as are above the distance should surprise us by appearing too small in the perspective drawing or photograph. Perhaps one of the most familiar instances of a near object above the central distance is that of a chandelier depending from a ceiling when the interior of a room is photographed. It may be enough simply to ask the question whether such an object really does surprise us by appearing too small in the picture.

A point, however, that it seems very strange should have escaped the notice of the writers, is that we see the photograph or perspective drawing with the same eyes that we see the objects of nature. If, therefore, it were a fact that a natural object, when at the bottom of the scene, appears smaller to our eye than it comes in mathematical perspective, then the same object in the lower part of the drawing, falling on the same diminishing part of the eye as the original object would, suffers a like reduction also, and the true effect will still be produced. The lines from the various points in a drawing in mathematical perspective or in a photograph, seen at a proper distance, fall upon the same parts of the eye as the lines from points in the natural scene would do, and both would suffer alike from the want of equality of vision assumed by the authors. The case is very similar to that of the supposed necessity for the lens to simulate the defects of the eye, which was for some time maintained by Dr. Emerson and a few followers.

Is there any difference between photographic and true mathematical perspective and perspective used by painters? Sometimes there is; painters allow themselves licences. If an interior has to be represented, a photographer must photograph it from a distance limited by that to which he can remove his camera. A painter will often represent the interior, as far as the leading lines are concerned, as it would appear if the observer were so far removed as to give what is called less violent perspective. There is no difficulty in doing this to anyone acquainted with the rules of perspective. If, however, the drawing is to be true throughout to what would be seen at the selected distance, care must be taken to obliterate such objects—as, for instance, a side window—which at a greater distance would be hidden by a pillar, and, in some cases, to show objects covered in the near view, but which would be exposed to view farther off.

Again, in painting figures, they will generally be represented as they would appear (with regard to comparative size of advancing the retiring portions) at such a distance as not to make these differences of size conspicuous. Sometimes, indeed, they are painted rather with the knowledge of the equality of the retiring and advancing portions of a figure than with the effect which perspective has in enlarging or diminishing them. Are these things passing conventions, and will photography cause any change in them, as it has done with other conventions? Time will show.

---

We have recently tried the improved sulphokinone developer sent to us by the Fry Manufacturing Company. The developer is in two solutions, which for a normally exposed plate are mixed in equal parts. In our hands the developer gives very fine results, especially for lantern slides. Several plates can be developed in the same mixed solution before it shows any sign of exhaustion.

Photographing the Dead.—It appears that a somewhat morbid custom exists among the Viennese of having the dead bodies of children and other persons dear to them photographed, and for this purpose the corpse used to be taken to the photographer's studio. The attention of the sanitary authorities having been drawn to the danger of the dissemination of infectious disease by this practice, a decree has been issued by the Austrian Minister of the Interior absolutely forbidding the photographing of corpses in studios open to the public, and the photographing of bodies of persons who have died of any infectious disease by professional photographers, even in private houses. Exception is made of cases in which such photographs may be required for police or medico-legal purposes. In the case of persons who have died of non-infectious disease, the corpses may be photographed at the private residence of the deceased, subject to the approval and on the responsibility of the medical official whose duty it is to verify deaths. This ordinance came into force on April 1st.—*British Medical Journal.*

## A NEW METHOD OF POSITIVE PRINTING.

BY DR. ALPHANDERY.

If the amateur photographer, or the professional himself, has much trouble in attaining perfection in portraiture, it is because the work of the sun generally requires the co-operation of an able artist. Wrinkles on the face, although they may hardly exist, and cannot be detected by the unaided eye, are found on the photographic print deeply engraved, and far more prominent than in nature. The various other blemishes on the skin which it is also difficult to discover, are brought out by the photographer with a kind of malignity, and, as we all know, it requires the adroit hand of the retoucher to do away with markings on the negative which give such unflattering results.

Both amateurs and professionals have tried to correct their negatives by mechanical means, and oftentimes they have given their imagination a free rein. One plan, for instance, which was long ago proposed, was to place before the lens a ground or coloured glass, and to give a short preliminary exposure before taking the photograph. But the general softening effect so obtained was in reality an incipient fogging of the whole plate. Another method suggested was, just before the end of the exposure, to rapidly withdraw the diaphragm from its slit, a procedure which was supposed to soften down by diffused light any portion of the facial lines which might be too greatly accentuated. This movement naturally led to vibration of the apparatus at the supreme moment, and the plan was quickly abandoned. Others, again, have advised that either the sensitive plate or the lens itself should be slightly moved during exposure, with the idea of bringing to a focus successively each part of the model, and of superposing, as it were, a series of sharp images upon another series of images out of focus. But although this method is as ingenious as the one which we have just considered, it is difficult to carry out, and necessitates the employment of special apparatus.

More practicable was the idea of that American who endeavoured to secure the same result during the printing operation. He conceived the employment of a printing frame which allowed the sensitive paper to be exposed close against the negative at the outset of the operation, but caused it to be withdrawn away a certain distance before the printing was completed. But here, again, was required a special apparatus which was relatively costly, and in which it was difficult to maintain complete parallelism between the paper and the glass; hence the contrivance has been quite forgotten.

The whole of these methods, however, depend upon a true principle, and it is only because there has been difficulty in the necessary manipulations that they have been rejected. Seeing this, we have tried to obtain analogous results without in any way thrusting aside the ordinary impedimenta of the photographic printer, and we have been able to solve the problem by a very simple artifice.

In the first place, we must endeavour to preserve the wrinkles, shadows, and general contour of our model, so as not to change his physiognomy; but, at the same time, we may fairly endeavour to prevent exaggerated hardness in the lines represented. But we do not seek to do this during the taking of the negative, which is simply done in the ordinary way, and under the usual conditions. Even the printing of the positive is carried out in the ordinary manner at the outset, and until the print may be considered to be about two-thirds or three-quarters on the way to completion. It is then that the modification comes in. At this juncture we simply take a sheet of glass, or any other transparent body, of from one to three millimetres in thickness, and slide it gently between the negative and the partially printed proof, *without displacing one or the other*. We then re-expose the frame until the print attains full vigour.

The first part of the printing has produced a normally sharp image, and the second, allowing the light to be diffused around each point in a regular and equal fashion, has gently softened those lines which might otherwise become too pronounced, and the desired result is obtained.

The only delicate part of the operation is the insertion of the plate of glass, and this is simplified if a larger printing frame than is actually necessary for the negative is employed. The best plan of procedure in this case is to place the negative in the angle of the larger frame employed, and to use a piece of positive paper for the print, which has an extra length attached, which can be shut in between the negative and the rebate of the frame, so that if the paper be raised for the insertion of the extra sheet of glass, both paper and negative shall remain in register. Printing frames are now made by many makers, the backs of which, instead of being hinged in the centre, are separated at one side, so that nearly the whole of the picture can be examined during the printing operation. It is obvious that such a form of frame is peculiarly fitted for the present purpose.

With regard to the thickness of the supplementary glass plate, it may be one millimetre, or two, or three, according to the discretion of the worker, and it should be put in position over the positive at a time when the picture has nearly attained its full strength. The result is not at once strongly apparent, but the softening effect is there, and it will be found that, by the employment of this device, the disagreeable sharpness and rigidity of feature so often seen in a photographic portrait becomes blended with a bloom and softness which cannot fail to prove attractive. As a general rule, and for an ordinary carte portrait, the best effect is obtained by employing a glass two millimetres in thickness, which should be interposed when the print has attained two-thirds of its correct value; but it must be understood that the thickness of the glass, and the precise moment when it must be inserted, must vary with the kind of negative, and with the particular effect which it is desired to produce. It is hardly necessary to indicate that this method is not indiscriminately applicable to all negatives. It would, for example, be ridiculous to employ it for the portrait of a man the accentuated lines of whose face constitute its chief characteristic. It is quite another thing with the portraits of women and children, where the hard lines come not by nature, but are made so in the process of photography. With platinum, or papers giving a black matt image, the appearance equals that which is seen in a carefully executed chalk drawing which has been softened by means of the leather stump.

The little artifice here described acts, as will be seen, automatically during the printing operation, but it is necessary to employ it with discretion, and with regard to the particular negative in hand. Artistic effect can be obtained by this means, but the operator must have artistic feeling to produce it. A method, however good it may be, requires that a man should know how to employ it, a fact which is too often lost sight of.—Abstracted from *Photo. Gazette.*

## NEW HAND CAMERAS.

Dr. Krugener, whose name is already well known in connection with the invention of an ingenious form of book-camera, which was introduced some five or six years ago, has now placed on the market two new forms of hand or detective cameras which exhibit several points of novelty. The agents in this country for these inventions are Messrs. Marion and Co., of Soho Square, who have kindly permitted us to thoroughly examine the instruments.

We will describe first the camera named the "Delta," which is made in three sizes, the smallest being $3\frac{1}{2}$ by $4\frac{3}{4}$ inches. This, like the others, is a standard French size of plate, and expressed in centimetres is equivalent to 9c. by 12c. This is a better size than the familiar quarter-plate, and Messrs. Marion supply plates of the required dimensions. The next size in which the "Delta" is made is $5\frac{1}{8}$ by $7\frac{1}{16}$, and the other camera of the three is for stereoscopic plates. The principal novelty in the "Delta" (see fig. 1) is the bellows arrangement seen on the top of the box at the end farthest from the lens. This constitutes the main feature of the changing apparatus, for the camera contains twelve plates, held in sheaths, which can successively be brought under the control of the lens. The bellows may be said to take the place of the leather or cloth bag which, in many forms of hand-cameras, is used for changing plates, and which permits the operator to take the front plate from the series after exposure, and to insert it at the back of all. In the "Delta," when it is required to change a plate, the operator unfastens the hooks which hold the bellows down, and inserts his finger and thumb through an orifice in the top, which is furnished with a light-tight cloth. But previously he has moved a button at the side of the instrument, which has the effect of raising the front plate out of its old position. He is thus able to grasp the sheathed plate, and by bending the bellows (as shown in fig. 2) he is able, after pulling it bodily out of its place, to thrust it to the back of the series. The "Delta" is fitted with a rectilinear lens, and all objects at thirteen feet distant and beyond are in focus. Its principal use is naturally for what is called "instantaneous exposures," but it can be used as well for *time* exposures. The lens is furnished with diaphragms, so that the aperture can be altered according to the amount of light available.

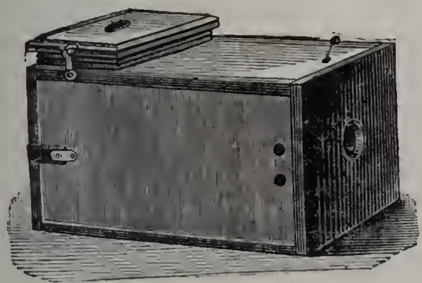


*Fig.* 1.

*Fig.* 2.

Dr. Krugener's other model is named the "Normal Simplex," and while it corresponds somewhat in outward appearance with the "Delta," its design is far more elaborate. In fig. 3 it is shown closed, as it would be during transport from place to place; but when ready for action there would be released from the square aperture, shown at the top, a small directing camera or finder, as seen in fig. 4. This finder pops up with a spring action when required, like a jack-in-the-box. The closed oblong aperture at the further end of the camera (see fig. 3) conceals the changing apparatus, which, as in the "Delta," is connected with a bellows. But whereas in the "Delta" it is necessary to *handle* the plate in its sheath before it can be changed, in the "Normal Simplex" the mere act of pulling out and returning the bellows shifts the foremost plate from front to back, provided always that the camera be held lens upwards during the operation, as shown in fig. 5. The mechanism by which this result is brought about is of the most ingenious character. When the bellows arrangement is pulled out, it brings with it the stock of plates with the exception of the front one, which is prevented from moving by a fixed stop. This plate, when the others are removed, and when the camera is held as described, falls by gravity to the back of the plate chamber, so that when once more the bellows arrangement is pushed home, it takes its place at the back of the series instead of at the front as before. So much ingenuity has been exerted in the contrivance of different methods of changing photographic plates that it would seem hardly possible to design anything of a really novel character, but it will be seen from our description of these inventions of Dr. Krugener that there is still something new to be said about even such a well-worn subject as that of plate-changing.

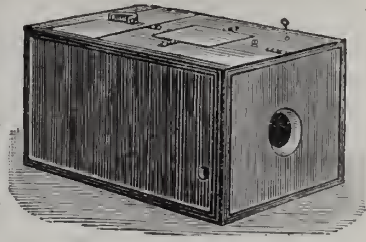


*Fig.* 3.

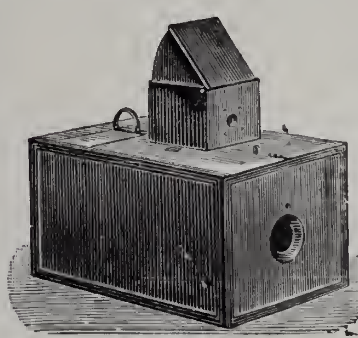


*Fig.* 4.

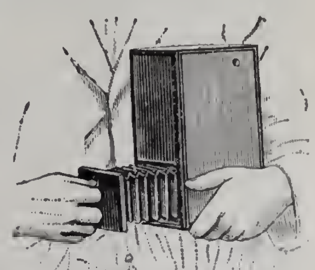


*Fig.* 5.

---

Intensification is a business that most photographers dislike on account of its uncertain effect upon the future of the negative to be treated, and yet it is a process which must occasionally be resorted to. Messrs. Hinton have done their best to simplify the operation by introducing an intensifier in two solutions which is quick in action, and is not in any way troublesome in its application. The first solution, mercury, is followed, after thorough washing, with one of cyanide of silver, and the increased density obtained is very great without any clogging or veiling of the shadows. We commend this intensifier to the attention of photographers.

## LENS DIAPHRAGMS AND STANDARDS.

### A Plea for Uniformity and Exactitude.

From twenty-five to thirty years ago—we might even curtail the period to ten years—any rough and ready system of notation of the diaphragm satisfied photographers. We find three important reasons to account for this ready acceptance of so much inconvenience arising from inexactitude. Firstly, there was a total absence of competition, as two makers monopolised almost the entire field of photographic optics. We do not pretend that the increasing number of present-day competitors renders the facilities for improvement of the optics of instruments any greater, but there can be little doubt that this competition has given a healthy stimulus to emulation for the favour of the public. Latitude of exposure was another reason for the indifference that dispensed with a general system of notation of the diaphragm. Before the advent of the modern dry plate, the difference between the exposures, necessitated by the varying diaphragm apertures, was not so important in the matter of latitude as to-day. With a slow plate, development of two plates, after the same exposure with stops of different apertures, might produce results indistinguishable by even an expert; whereas, now, one and a-half times, or double the "exact" exposure, which is a size larger than the correct diaphragm would yield, might ruin the negative. Then, again, at the period of which we write, education in photographic optics was sadly neglected, and any rough and ready method of diaphragm notation satisfied the photographer. Advances in this direction soon changed the old order of things, and such was the popular clamour for something better than the old clumsy methods of notation, that it could not be denied. Sets of stops, as most of our readers will remember, were originally marked simply with successive numbers from one upwards, according to their diminishing apertures; with, perhaps, an X on a stop where the aperture did not diminish in the same ratio. These numbers were identical, whether the lens with full aperture had an intensity ratio of one-third or one-fifteenth. How, then, was it possible to compare readily, say, the fourth stop of the former with the second stop of the latter with a view of ascertaining the relative exposures?

The Photographic Society of Great Britain, with an amount of energy characteristic of its earlier years, took the subject in hand. A committee was appointed, several meetings were held, and a standard of unity was decided upon. This, we venture to think, made "confusion worse confounded," and, therefore, we are not a little surprised to learn that the Lens Standards Committee has now, after mature consideration and a thorough discussion of the question, adopted exactly the same standard. This standard is $f/4$; that is to say, a stop bearing this ratio would be marked 1; one having an intensity of $f/8$ marked 4; and so on. Why this arbitrary rule, in the name of all that is optical, we do not know. The original reason given was that $f/4$ represented the largest working aperture of the portrait lens then in use; but this reason was as fallacious as it is ridiculous. The largest aperture of lenses then in use was, as nearly as possible, $f/2{\cdot}5$. Then came another lens, that of "B" portrait form of about $f/3$, which both then and to-day is used more extensively than any other in point of initial aperture. Even assuming the reasonings of the committee of the Photographic Society to have been correct, which they certainly were not, what was or is the use of commencing a standard with the aperture of a portrait lens, when the fact remains as notorious to-day as it was then, that ninety-nine out of every hundred professional photographers, to whom the use of portrait lenses is confined, never study any standard at all, nor have they, in fact, ever asked for one. It is the educated amateur photographer who seeks exactitude, and is not content to-day to work by rule-of-thumb.

If no better standard could be devised than one having as its unity the initial intensity of the lenses most in use, surely it might have been obvious that $1/7{\cdot}5$, which is about the intensity with the full aperture of the rapid rectilinear or symmetrical combinations, the lens then used by almost every outdoor or landscape photographer, though bad, would have been far more convenient to the amateurs of to-day, who cannot understand why $F/4$, any more than a theoretical $F/1$, should be adopted as a unit. In fact, we do not know whether such a theoretical unit as the latter, which is, at least, unity, would not be better. Some four or five years ago, when amateurs of an inquiring turn of mind were attempting to understand this "U.S." (which we believe stands for *Uniform* System—save the mark!), a well-known optician startled these enquirers, and horrified the founders of the Photographic Society's standard, by leaping into the gap and suggesting another standard, viz., $1/\sqrt{10}$. Here was a standard ready made, which, for means of calculation of comparative exposures, required—after the division and squaring process, necessary with any system—a mere shifting of the decimal point. This system possessed the advantage, moreover, of enabling any one, by eliminating the decimal and extracting the root, to calculate in a moment what was the actual intensity ratio of the aperture employed.

But some of the photographers of the old school refused to have anything to do with this "new-fangled" notion. This was, apparently, from motives of abject terror at the mathematical symbol, $\sqrt{}$. It was then attempted to alleviate this feeling by pointing out that the square root symbol had nothing but a theoretical significance, being merely used as a convenient substitute for an infinity fraction, but all of no avail. The powers that were remained obdurate, with the result that three systems remained in force, with the consequence that a purchaser of a photographic lens has a "system" thrown in with his instrument. Notwithstanding the decision of the Lens Standards Committee, these three systems will, unhappily, continue to prevail. The Paris Conference has, however, we are pleased to learn, made a move in the right direction by adopting a system—viz., $f/10$. This is, at least, a decimal system, and, for the purpose of ascertaining the intensity ratio, requires a mere shifting of two decimal points. We understand that a conference on the subject is about to be held at Brussels, when further discussion will take place.

There is one other matter of importance, which, in reality, occupied our minds when we commenced this article. We refer to the utter disregard which, in calculating intensity ratios, is paid to the effective aperture of the stops, as opposed to the bare diameters. Very few photographers are aware that the intensity ratio is always greater than the reciprocal of the quotient obtained by dividing the focus of the lens by the diameter of the stop, and that this difference varies much with lenses of different construction. In any system that may be adopted, too much stress cannot be laid upon this point. It should be incumbent upon opticians to give the real, and not the apparent, focal values of each stop. We think, moreover, that the precise equivalent focus of every combination should be engraved upon the mount. Opticians need now no longer fear complaints created by slight variations in focal lengths from those catalogued. Photographers have long ago discovered that specified focal lengths, especially above six inches, are but approximate.

Finally, we would urge that at the Brussels International Conference, to which we have already referred, arguments for different systems should be considered on their own merits, and that no consideration of existing standards should be allowed to prejudice the minds of a committee. It is quite possible that still better methods than those in vogue may be submitted, and that one of them might be adopted. We heartily commend the further ventilation of this subject to our photographic contemporaries and opticians interested in the subject. Photography is young, and there is still time for its optical arrangements to turn over a new leaf and revise its complicated methods. When once a satisfactory and uniform system—uniform in more than the name—is agreed upon, and a concise explanation of that system has been given to all photographers, owners of instruments marked on the old method would soon, we venture to believe, be only too ready to send them to opticians to be re-engraved or re-modelled upon the reformed principle.—*The Optician.*

REMEDY FOR SORE FINGERS CAUSED BY HYDROQUINONE.—M. Dollé sends to the Paris *Moniteur de la Photographie* the following letter :—"I have read in the *Moniteur de la Photographie* a description of a skin disease on the fingers caused by hydroquinone, disease which the fingers afterwards carry to the face. I have met with this accident several times, and the article in question is very exact. Allow me, in the interest of your readers, to furnish you with a remedy, very simple moreover, which causes the eczema in question to disappear in three or four days. Spread over the affected parts, on going to bed, a rather thick coating of lanoline (grease extracted from sheep's wool), cover with an old kid glove, which is to be kept on all night. I have made many experiments, but with lanoline I have been very successful."

A MONKEY TAKES THEIR PICTURES.—The season for the spring campaign of the travelling photographer has coldly opened, and a man who for many years past has had a monopoly of the district lying around High Bridge felt that, if he proposed to hold his own against an opponent who invaded his territory a week before he got there, it would be necessary to hire a more able and industrious assistant than the boy who has hitherto helped him to carry his camera. He began operations yesterday, attended by a tall, lean monkey, dressed in a red coat with brass buttons. His old servitor was there too, for the photographer had found it necessary to retain the lad to attend upon the monkey. Presumably the artist does the work, as formerly, but the monkey seems to be the genius of the camera. Mounted on a forked stick stuck in the ground, he inspects the position of the person about to be photographed, burying his hairy head under the cloth that covers the rear part of the instrument. Then he stretches forward his long arm and removes the cap. For, perhaps, two seconds he holds it in his hand, while he frowningly stares at the subject. Then he covers up the lens, and the picture is taken. It is, perhaps, the first time that an ape has been responsibly engaged in the service of art, and, with the children at least, the innovation is very successful. The fact of having a photograph taken by a monkey is not only irresistibly attractive in itself, but the presence of the animal behind the camera effectually prevents the juvenile attention from wandering, and brings an intensely interested expression, often emphasised by too broad a grin, to the little face in front. It is not expected that the rival photographer, with an improved instrument, and, perhaps, greater skill in using it, can long make headway against the monkey.—*New York Sun.*

# Notices of Books.

PHOTOGRAPHY ANNUAL FOR 1891. (*Iliffe and Son, London*).

THIS bulky volume appears now for the first time, and at a period of the year when it has not any other publications of a similar character to compete with. It contains much useful matter, and has been compiled with skill and care. There are several good illustrations, the reproductions of the photographs of the moon by the Brothers Henry being especially worthy of attention. The book would, in our opinion, have been improved if the section devoted to a description of apparatus—which too closely resembles a trade catalogue—had been either omitted or greatly curtailed.

TRAITE PRATIQUE DES AGRANDISSEMENTS PHOTOGRAPHIQUES. By E. Trutal. (*Paris: Gauthier-Villars et Fils*). Second part.

IN the first volume of this work the author called attention to the different methods by which small negatives may be obtained, and he now, in this second volume, shows how they may be enlarged, and describes the various methods available. Enlargement by means of the camera, and the obtaining of enlarged positives on glass or paper by that means, occupies the first chapter of the book. The second chapter is filled with a description of solar enlarging, and different forms of heliostat. Different kinds of artificial lights come next under review, and the book concludes with a chapter on manipulation and development of positive papers. The work is very fully and well illustrated.

TRAITE PRATIQUE DE ZINCOGRAPHIE. By V. Roux. (*Paris:* Same publishers.)

THE progress in zincographic work has been, within recent times, so rapid, and new modifications are so constantly being introduced, that a book on the subject soon becomes antiquated. In this little volume M. Roux has given a clear account of all the necessary manipulations according to the latest ideas, from the preparation of the negative to the obtaining of a relief in metal. This book is practically a new one, although it is marked second edition, for it has been greatly augmented, and, as we have already indicated, brought up to date. It will be a most valuable work of reference to those who wish to practise or to gain a knowledge of the fascinating art of zincography.

LA FORMATION DES IMAGES PHOTOGRAPHIQUES. By A. de La Baume Pluvinel. (*Paris:* Same publishers.)

THIS volume of 200 pp. is devoted to the chemical aspect of photography, and describes with clearness the changes produced on various substances by the action of luminous rays. It is a work which many who are apt to pay more attention to the practical work of the studio and dark room would do well to read and digest.

PHOTOGRAPHIC EXHIBITION AT THE AUSTRIAN MUSEUM.—We are requested by the translator to insert the following corrections in the article on this subject by Herr James Von Falke :—For "but in the Chinese manner the sun will not work," read "but in the Chinese manner this is impossible"; for "fine lad's portrait of Arthur Chevalier de Bourchelt," read "fine portrait of a lady by Mrs. Susan Hodgson, and the portrait of a knight by Arthur Burchett."

## Notes.

The French paper, *Les Annales Photographiques*, describes a new kind of printing paper which it believes will obtain a certain degree of popularity. It is said to be the outcome of certain experiments by a Russian amateur, Mr. Soukatcheff, to be five or six times more sensitive than ordinary albumenised paper, and to give prints of a rich brown tone. This colour is varied by after treatment, for the paper can be developed, like a blue print, in simple water, or can be toned and fixed like an aristotype print. A specimen of the paper has found its way to Paris, and is favourably reported upon by the journal above named.

No class of photographs are more interesting to stay-at-home town dwellers than those relating to volcanic phenomena. These phenomena are, happily, so far removed from us, and, at the same time, have about them such a spice of the mysterious—we might almost say supernatural—that they possess a fascination of their own. The photographs, moreover, show us something new, for they are vastly different from the conception of volcanic outbursts which we gathered in our childhood from the fatuous engravings which adorned the educational books of the period. Hence it is that Dr. Tempest Anderson's photographs of the volcanic districts of Iceland, shown at the *conversazione* of the Royal Society the other night, were looked upon with profound interest. Some similar pictures taken in the Lipari Islands were shown among the lantern slides at the late *soireé* of the Camera Club, and these, too, were of a noteworthy and interesting character, some of them being taken within the actual crater.

Those who wish to see how well line drawings turned into blocks by photo-zincography can be printed on a quick machine, should buy that wonderfully cheap pennyworth, the holiday number of the *Daily Graphic*. This is, in many respects, the finest number of that journal which has yet appeared. The drawings have, apparently, been reduced from the originals to a greater extent than heretofore, and the result is a fineness of line which brings them into real rivalry with wood engravings. The subjects illustrated are the various sea-side resorts within easy reach of Londoners, and the places can not only be recognised at a glance, but the pictures are full of life and bustle owing to the presence of admirably drawn figures. If the *Daily Graphic* keeps up to its present standard, it will soon double its already large army of admirers.

We are reminded of a useful old method of obtaining from a very thin negative a duplicate which will yield a vigorous print, by seeing it exhumed and published as a new discovery in a foreign journal. The method is applicable in the case of a very thin, over-exposed negative, full of detail, or in the case of an experimental picture taken by gas or other weak light, when the detail has had to be coaxed into appearance by careful and prolonged development. The negative, after fixing and thorough washing, is bleached in a solution of mercuric chloride, and dried. It now appears as a positive when backed by any dark material, black velvet being, perhaps, the best which can be selected. The glass so treated is now set up before the camera, and a new negative is made from it without difficulty. This simple process will often be found of great service, and it has the merit of not subjecting the negative to any risk of destruction.

The resources of advertisers are legion, and, since the optical lantern has been enlisted in their service, they have seen many more loopholes through which the public can be successfully shot at. The proprietor of a hair restorer has just been fined the stereotyped forty shillings for causing an obstruction in Clapham by the exhibition of lantern slides from a waggon, which slides depicted the marvellous growth of hair which might be expected on the human cranium by a steady perseverance in the use of his nostrum. We say *expected*, because we know that promise in these matters does not always lead to realisation. Some time ago we became acquainted with the manager of a large drug store which dealt largely in these so-called restorers, and, seeing that his head was nearly as bald as a billiard ball, we ventured to hint most delicately that he might do worse than try some of these much vaunted specifics himself. He looked up pathetically, and said, "My friend, I've tried every blessed thing in the warehouse!"

When a policeman makes use of a telescope to detect offenders against the law, the employment of a camera cannot be far off. A Merthyr Tydvil constable, the other day, with a powerful glass watched a public house a quarter of a mile away, and witnessed, so he asserted, an infringement of the Licensing Act, and the magistrate, after examining the telescope, convicted the defendant. We are not told in what way the "examination" of the telescope was conducted, whether it was put in the witness box or not, but doubtless its evidence was satisfactory, or the conviction would not have been arrived at. It would, however, have been better had there been an adaptation of the camera to the telescope—by no means an impossible thing. A photograph of whatever the offence was would have been more convincing than the "examination" of a telescope.

It is gratifying to learn, in spite of a foot-note in *Punch* that "drawings will in no case be returned," that Mr. *Punch* does occasionally condescend to send back the drawings to the artists who send them in on approbation. But it is not pleasing to get a drawing doubled in half and practically spoilt—an experience which, it is said, happened to a well-known artist. To avoid this unpleasant contingency, why do not artists become photographers and photograph their drawings, sending in copies to the editors of illustrated papers, and retaining the originals?

The *Globe*, in commenting upon Dr. Emerson's paper in the *Magazine of Art*, is of opinion that before photography becomes (if it ever becomes) absolutely artistic, it will be well for it to become accurate. At present, says our contemporary, the epithet "photographic" by no means conveys the idea of scientific exactitude. Possibly not; but are we still to believe in the time-worn phrase, "The truthful and beautiful are one," of which the late Lord Lytton was so fond? If so, there is a field for discussion open for which even the *Globe* would not be large enough. If the truthful be necessarily the beautiful, another and more important question must first be asked. "What is truth?" said jesting Pilate, and the answer is as difficult to find now as it was in his day.

## THE PORTRAITURE OF THE SUN.

BY JAMES MEW.

THE pursuit of astronomy is entrancing, but, like other entrancing objects of desire, is apt occasionally to lead its votary into a quagmire of distress. More than a score of years ago, Goldsmith, in his *Citizen of the World*, warned the public of his period against the particular infatuation of astronomical study, by the history of a philosopher who suffered no light domestic misfortune while his attention was too much occupied with a compassion for the inhabitants of the moon. In a page of this philosopher's diary we meet with the following entry: "The moon is, I find, at her old pranks. Her appulses, librations, and other irregularities, indeed, amaze me. My daughter, too, has this morning gone off with a grenadier. No way surprising! I was never able to give her a relish for wisdom; she ever promised to be a mere expletive in the creation. But the moon, the moon, gives me real uneasiness," and so on. Now if the moon, which, as compared to the sun, is called religiously rather than scientifically the lesser light—if the moon without the assistance of photography was able to cause this amount of intellectual and emotional disturbance in the mind of articulately speaking man, what is likely to be the result of a photographic interest in the sun, the blaze of whose photosphere so far exceeds all artificial splendour that only the electric light is not absolutely black against its flaming orb.

It has been said that the sun, known to scientists as a cooling cinder, was the first celestial object photographed for scientific purposes. Soon after Daguerre's discovery the moon and stars were "taken," but not for such advancement of knowledge as was intended by early heliographic pictures. Sir W. Herschel, the greatest observational astronomer, in Proctor's opinion, that this world has ever seen, imagined the sun to be a solid globe under a luminous atmosphere. He accounted for the nuclei and their penumbræ, the spots which photography has made so familiar at the present day, by supposing that this atmosphere or garment of light was occasionally removed, so as to discover the naked body of the sun, just as the moon is seen from time to time through the apertures formed by the discontinuous passage of a scudding cloud. Nor was this enough to satisfy the hunger of his fancy. He maintained, with seriousness, if not with vehemence, the probability of a population existing on this solid solar globe. He refused to believe in the sun as a source of light and heat—an attractive centre and nothing more. When met by the objection that the people of this particular star might find their mansion inconveniently warm, he kindly invented, solely for their comfort, a sort of envelope of a substance not clearly defined, and unknown to the physical world. The population of the orb of day is no new thing. Intelligent beings had been found in it long previous to the production of our pretty pictures of sunlight and silver. The poets had already placed in it the blessed spirits of the departed, and Tobias Swinden, with a strange pertinacity of contradiction, the souls of the reprobate and the damned. But Sir John Herschel went beyond his sire. Not content with admitting the possible coolness of the solar globe, he thought it not unlikely that the inhabitants themselves emitted the chief part of the light and heat with which this earth is supplied. Those willow leaves, familiar to the eye of astronomical speculation, roaming over photographic solar charts, those rice grains scattered over the photosphere, like spills in the game of spillikins, were for Sir John organisms possibly partaking of the nature of life—Brobdignagian creatures of some thousand miles in length and some three hundred in breadth. Professor Young, of Dartmouth College, Hanover, U.S., in 1871, differed widely from both the Herschels. He held the sun to be a bubble, gigantic, with gradually thickening walls and diminishing diameter, whose skin, formed by a constant downpour of metallic rain, was continually burst by blasts from within.

As Philoctetes was cured by the rust of the very spear which had wounded him, so, if an ancient historian may be believed, may the solar photographer look for relief to the cause of the disturbance of his mental equipoise. Pliny, in the second book of his "Natural History," speaking of the sun, calls it the mind of the universe, and deity of nature. It is the sun, he says, which dissipates the sadness of the sky, and clears into serenity the clouds of the human intellect. The last portion of the great naturalist's description of our system's self-luminous centre, and our source of life, "of this great world," as Adam and Eve called it in their morning hymn, "both eye and soul," seems almost prophetic of the photographic art.

It were idle to attempt the enumeration of the many ways in which photography has extended knowledge and disseminated delight by the aid of the sun, that most interesting and useful to us of all the stars, which people the blue depths of infinite space. Albeit only $\frac{1}{2300000000}$ part of the heat and light of this resplendent orb is accorded to our earth, a single child of the large solar family, this portion has been found amply sufficient to satisfy the desire of the most covetous of photographers.

Photographs of the sun are, says Janssen, the easiest to obtain and the most difficult. If merely a general reproduction of our central star, with its spots and penumbræ, be desired, no remarkable difficulty stands in the photographer's way; but the path is full of pitfalls for him who wishes an exact likeness of the elements which form its luminous surface. Only lately, according to a well-known artist, has the true construction of these elements been satisfactorily determined. The streaks or *striæ* of the penumbræ and the faculæ of the spots seem to be both formed of those granulations, of which the true shape has been revealed by photography alone. They constitute a primordial element, as it is now believed, of all parts of the photosphere. But they are of widely distinct appearances. The polygonal set, shown in Janssen's pictures, represents the contours of the polygons marked by elongated granules, while their centres are distinguished by granules of a circular form. The vast number of these variations, shown by photography in a fraction of a second, could not be expressed in a day, or a month, or a year, by the most assiduous draughtsman. It is only the camera which can catch arrangements incessantly modified with every passing instant. Our earth, we are told, moves with a rapidity some three-score times greater than that of the swiftest projectile known to modern science, but photospheric granules are hares compared to which our earth is but a tortoise in its motion.

In 1842 the sun, partially eclipsed, was photographed by M. Majocchi. The first complete solar photograph seems to be due to MM. Fizeau and Foucault in 1845. In this Daguerreotype the inferior luminosity of the sun's borders was clearly shown, indicating the probable presence of an absorbent gas extending round the photosphere. A long time elapsed after this before the maculæ and the faculæ containing them made their definite appearance in the sun's photographic likeness.

(*To be continued.*)

## NOTES ON LANDSCAPE.*

BY FRANCIS L. PITHER, ARCHITECT.

Landscape art may almost claim to be indigenous to these islands, living as we do under climatic changes more singular and recurrent than in almost any other quarter of the globe; in a country affording endless variety of conformation, from the dark purple granite of some parts of the north, through the beautiful and romantic lake district, the hills and glades of Derbyshire, with the prospect from some broad crested hill stretching out as far as the eye can see, to the beautiful undulating downs of our southern counties, back to the granite again to be found on the coast of Cornwall. All these make the study of landscape art peculiarly fascinating, and, one might almost say, pre-eminently English. Think for a moment if this is not so. Go back in mind no farther than your last country walk to the vivid recollection of the vast expanse before you in all its many-hued glory of nature's changing moods, and say if you can pick out from a collection of photographs types which shall express nature joyous, nature sorrowful, or nature terrible. This, then, is what we have to aim at. Not that every stone, every bough, every leaf, shall be recognisable, but that our work shall convey a distinct impression of sorrow or of gladness. In a word, this toiling after minutiæ can never help us to translate the latent beauties of nature, for, however excellently done, these things are but dots and specks in the field of our vision, and in measure, as they are prominent, only defeat our aim. This leads up to the consideration of that quality we have before referred to, and which artists describe by the name of breadth. We need not be ashamed to own that it is one of the most difficult to get into our work, for the want of it has marred many a picture otherwise perfect both in colour and composition.

It is a little difficult at first to appreciate the full meaning of the term, because a broad mass of light or shadow will not give breadth, but spottiness, coarse or fine, in proportion as their areas are related to the size of the picture. Speaking generally, therefore, we may say it is the direct negative of spottiness. If you should have more than one point of light, breadth requires that these points shall the one lead up to the other to a point of focus in the whole, and be not in any sense competitive; equal lights or equal darks diminish breadth, as does also abrupt transition from light to dark, or the *vice versa*. To make the definition still clearer, we should say that a large luminary such as the sun affords breadth of light, whereas a lamp or a candle affords breadth of shadow.

Before leaving this branch of our subject, we will just examine one notable instance that comes to mind. Rembrandt, in his "Adoration of the Shepherds," will be found to have employed his customary mass of darks leading up to a group of lights, the form of which is still more emphasised by being contrasted with the dark mass of one of the shepherds.

We will now pass on to consider some of the elements that go to make up the composition of a picture. We have all read in various treatises of the elaborate division and sub-division of the area of the picture into thirds and fifths in length and breadth. Now, inasmuch as these rules have been advised and enlarged upon by highly respectable authorities, it may be considered improper, not to say audacious, in me to take any other view; but I really think that this is one of the advantages we must be content to allow that the painter, with his greater command of leisure, and his more deliberate methods, has over photographers, for it seems to me that these rules are far too cumbersome to put in practice when we are making our selection on the screen, besides which, I can conceive nothing more dreary than some one idea or set of sub-divisions becoming fashionable among us, suggesting a dull uniformity of effect quite the reverse of pleasing; rather should we follow our separate instincts, taking that which appeals to the art feeling within us. Mind, I do not wish to imply that these rules are wrong, but only that they should not form the ground-work of the first building up of our subject, and only being used to resolve any doubts that may arise in the after-process of selecting certain portions of our plate for the finished picture. While I think it quite possible to produce indifferent results by fettering ourselves with too elaborate sub-division, we cannot afford to neglect certain simple first principles, which I put in negative form for the sake of greater emphasis:—1st. No prominent line or feature should equally divide the picture, either in height or breadth; this is too obvious to need enlarging upon. 2nd. No continuous line to run parallel to either edge of the picture. This obviously does not apply to architectural work pure and simple, and exceptions may be allowed where a distinct purpose has to be worked out. 3rd. Parallelism in any direction to be avoided, unless much broken up or counterbalanced, as in the view of one of the side canals at Venice by Gaucherel. The exercise of these three simple rules will keep us clear of any glaring error, and will, I think, be found sufficient to bear in mind when engaged upon the preliminary work of focussing.

The third division to which I wish to draw your attention is that of atmosphere. Painters say a picture is full of air when they wish to express that this quality has been secured. In landscape work it is, of course, indispensable, for it is the one thing needful to qualify the several planes in a picture, and give interest to the whole; in this way it may be said to go hand-in-hand with breadth. A careful study of some contemporary work will explain the *modus operandi* of arriving at effects often exceedingly beautiful. It may even be called the one string that the school of impressionists have established. Whatever of beauty is found in their work, and whether we like their work or not, this much must be allowed: that they have opened up a fresh page of art interpretation at a time when the poetic interpretation of nature seemed an absolute dead letter. I regret exceedingly being unable to instance pictorially the full force of what this means; but a reference to some of the best etchings of Whistler's, Daubigny's, and Corst's—and, secondarily, some of Van Hier's work in Regent Street will sufficiently explain this point. I remember, some years ago, a very fine picture by Wyllie in the Academy; it was afterwards bought by the trustees of the Chantry Bequest. The title was, I think, "Toil, Smoke, and Grime on a Flowing Tide," and affords an excellent example of some of the subtle effects of atmosphere. The scene is in the Pool, with the bows and funnel of a steam-tug in the immediate foreground, backed up by that peculiarly dazzling shimmer which moving water has under a strong sun. And note how the inevitable hard-

* Concluded from page 463.

ness has been escaped; the whole of the outline of the boat against the light background is as restless and uncertain as the water itself.

Now, am I right in saying that ye gentlemen of the sharp definition school should have a little of your hobby. Yet one more instance before leaving this section of our subject. A cathedral city with the minster towers or spire rising from the roofs in the foreground. Let us see how Roberts, or Prout, or Turner would treat it. Shall we find the outline sharply defined from summit to springing? Not at all; as the form nears the buildings in the front it will gradually become less distinct, finally losing itself altogether in the atmosphere that actually divides the planes. Now, both these effects are to be produced on our negatives—if the state of the light has not already done it for us—by a judicious after-treatment with light washes of Indian ink as before explained. Please note that I refer at length to this because my experience of photographs tends to the belief that the average operator would not think it worth while to expose unless he could see all sharp on his screen at the time of focussing.

## STAR PHOTOGRAPHS.

At the last meeting of the Royal Astronomical Society, Mr. Knobel read a paper by Mr. H. C. Russell, director of the Sydney Observatory, entitled, "Notes on some Star Photographs recently taken at the Sydney Observatory." The paper was accompanied by prints of several photographs taken with a camera of 6 in. aperture, and about 30 in. focus, and with the 13 in. photographic telescope with which the Sydney Observatory will join in the international survey of the heavens. With both of these instruments, photographs had been obtained of the $\eta$ Argûs nebula, one with an exposure of eight hours, and another with an exposure of five hours. Though a considerable extent of the nebula has been photographed, its light seems to be less actinic, and to act much less rapidly on the plate than the light of the great Orion nebula. On the other hand, Mr. Russell remarks that the light of many parts of the Milky Way in the southern hemisphere seems to be very actinic, and that, in many regions, stars and nebulosity are photographed where the eye sees nothing with the telescope.

Dr. Gill said: I had the pleasure of examining Mr. Russell's photograph of the $\eta$ Argûs nebula the other day, and I certainly never saw a more beautiful photograph of a nebula. Not only is there a great deal of nebulous detail shown, but the stars, down to the smallest, are represented by exceedingly sharp and well-defined points. This nebula is certainly very deficient in blue light, and photographs very slowly. On the other hand, there seem to be many regions in the Milky Way where the stars photograph very rapidly, and seem to be rich in blue light. This is very interesting in connection with what Prof. Pickering has published with regard to the brighter stars of the Milky Way being all of the Sirius type. We were at first very much puzzled to find the Milky Way stars in the southern heavens showing a greater photographic magnitude than their eye-estimated magnitudes warranted. Their magnitudes as determined by photographs were generally half to three-quarters of a magnitude too great as compared with eye estimates. This might have been due to their being seen on a brighter background than other stars, which might cause the eye estimates to be systematically too small, or it might be due to a difference in the nature of their light. Prof. Pickering's spectroscopic observations showed that the larger Milky Way stars were generally of the Sirius type, and were rich in blue rays. Now, we find the smaller stars of the Milky Way having a photographic magnitude above that which would be indicated by eye estimates, and, consequently, they are probably blue stars; therefore we probably have in the Milky Way a structure in the heavens which, according to the theory of the evolution of stars, seems to be a more recent structure than other parts of the heavens.

Mr. Ranyard said: I have examined Mr. Russell's photographs with a great deal of interest. The larger photograph of the $\eta$ Argûs nebula shows great extensions of the black rifts we were already acquainted with. There is one of them which is very striking, and looks like a dark branching tree on a bright background. I should like to remark, in connection with what Dr. Gill has been saying, that the Milky Way is a region of red stars as well as of blue stars. For example, in the region of the Coal-sack, when Mr. Russell's photographs have brought out streams of small stars over an area where the eye sees only blackness, there are several red stars which seem to be associated with blue in a cluster. Whether the photographing of these small stars is due to their blue colour or not it is difficult to say. It seems to me that everywhere the photographs reach a lower magnitude than can be reached by the eye.

The President: We must return our grateful thanks to Mr. Russell for these valuable photographs; and also, I think, to Sir Howard Grubb for the beautifully defining lenses with which they have been taken.

The Astronomer-Royal showed some photographs which he had obtained of stars when making use of the wire gauze screens recommended by the Photographic Commission. These photographs were thrown upon the screen, and showed that there were spectra symmetrically situated around the image of the star. The Astronomer-Royal thought that slight differences in the screens—for example, if they became bent—would give rise to variations of the amount of light in the central image as well as in the spectra, and that, consequently, they could not be relied upon, as constantly reducing the light of stars through two magnitudes.

Photographing the Empress of Germany.—Thursday was set for making a photograph of the Empress, and, in accordance with the directions received from the Chamberlain, and, in fact, from the Emperor himself, on the occasion of a previous visit, your correspondent, accompanied by photographer Russell, took an early train for Potsdam, where the sitting was to be. Arriving about 10 o'clock at the pretty little station where one leaves the cars for the royal palace, a comfortable coach was found waiting, together with the information that the Empress had not yet returned from Berlin, but was expected on the train that would immediately follow. Meanwhile we were accorded free run of the palace, in order that we might select a spot suitable to serve as a background for her Majesty's portrait. Granted this exceptional privilege, we naturally took time to look about us, and finally decided upon the royal billiard room as presenting the most picturesque possibilities. Fifteen minutes after noon, and just that number of minutes late, the Empress entered the room. She greeted us in the most gracious and unaffected manner, speaking in English with much less accent than is detected in the English of the Emperor. She walked to the further end of the room, where she saw we had arranged a place for her, and signified her readiness for us to proceed. As she sat in an easy and graceful pose upon one of the chairs, with a portion of the rich golden hanging forming a tasteful foil to her sea-green dress, she seemed every bit an Empress. While not beautiful, she has a face which is attractive and charming. It bore a half-laughing expression, and the dignity in her manner was not abated in the least by the almost unceremonious ease with which she permitted Mr. Russell to arrange her dress and surroundings for the photograph. The Empress wore magnificent pearls with this costume, and her neck and shoulders and arms were beautifully white and rounded. When we had taken her in five different positions in this costume, she left the room and presently returned wearing a dress of black lace, with a magnificent display of diamonds. In this costume we made six more negatives. At the conclusion of the sitting, her Majesty asked us a few questions concerning the photographs we had made of the Emperor, how the negatives had developed, and whether we thought the likeness would be good. She then very graciously said that luncheon would be served to us before we left, and with the most pleasing thanks for our services she left us. A servant appeared, who conducted us to the luncheon room, where we were served with a bounteous repast, laid before us on a golden service.—*New York World.*

## THE EDER AND SCHIENDL CONTROVERSY.

WE have received from Dr. Eder a voluminous letter combating many of the statements made by Herr Schiendl which lately appeared in our columns. We regret that we cannot devote any more space to this dispute, which is certainly of no interest to the majority of our readers. Dr. Eder's original communication was inserted in our columns before the present Editor assumed the reins of office, and, as a matter of courtesy and fair dealing, he gave space to the answer of Herr Schiendl. He did so somewhat reluctantly, for the matters in dispute were many of them of a very trivial character, and interesting only to the two contributors. Both disputants have now had their say, and the correspondence must cease.

## SOME NEW ADDITION COMPOUNDS OF "THIOCARBAMIDE" WHICH AFFORD EVIDENCE OF ITS CONSTITUTION.*

BY J. EMERSON REYNOLDS, M.D., F.R.S., PROFESSOR OF CHEMISTRY, UNIVERSITY OF DUBLIN.

*A compound of ammonium iodide with thiocarbamide* was obtained in the same way as the bromide; that is to say, 3·6 grams of ammonium iodide and 7·6 grams of thiocarbamide (1 : 4 mols.) were dissolved in separate quantities of hot alcohol; the solutions were then mixed, and the mixture boiled. Combination took place as in the case of the bromide, and a similar felted mass of crystals separated on cooling. The product was washed with cold alcohol, twice recrystallised from the same solvent, and dried.

The melting point of the pure compound is 186°, but the substance begins to decompose at about 190°.

I. 0·27 gram gave 0·545 $BaSo_4$
II. 0·2475 gram gave 0·131 AgI.

The formula $(H_4N_2CS)_4NH_4I$ requires—

| | Theory. | Found. |
|---|---|---|
| S ... .. ... | 28·50 per cent. | 28·74 per cent. |
| I ... ... ... | 28·28 ,, | 28·60 ,, |

There is, therefore, no doubt that the compound formed by ammonium iodide is similar in composition, as well as in general characters, to that afforded by ammonium bromide with thiocarbamide.

*An ammonium chloride compound with thiocarbamide* was prepared as follows:—1 gram of pure ammonium chloride was dissolved in the least possible quantity of boiling 85-per-cent. alcohol, and was added to a solution, also boiling, of 6 grams (or rather more than 4 mols.) of thiocarbamide in alcohol. Combination took place, and a felted, crystalline mass separated on cooling, closely resembling the bromide of ammonium compound. The substance was recrystallised from boiling alcohol, washed well with cold spirit, and dried. Its melting point was 154°.

A sensible excess of thiocarbamide was used in this preparation, and the crystalline product seems to have the power of carrying down with it and retaining persistently some of the free amide, and, as repeated crystallisation from even moderately strong alcohol tends to decompose it, in the following sulphur and chlorine determinations the former is high and the halogen proportionately low.

I. 0·3535 gram gave 0·9447 $BaSO_4$.
II. 0·256 gram gave 0·0945 AgCl.

The formula $(H_4N_2CS)_4NH_4Cl$ requires—

| | Theory. | Found. |
|---|---|---|
| S ... ... ... | 35·80 per cent. | 36·74 per cent. |
| Cl ... ... ... | 9·93 ,, | 9·12 ,, |

* Continued from page 463.

The results indicate that the product obtained is the tetrathiocarbamidammonium chloride analogous to the bromide and iodide. It may be added that only tetrathiocarbamide compounds were produced in the cases of the iodide and chloride, as well as in that of the bromide.

B.—*Substituted Thiocarbamides and Ammonium Bromide.*

Experiments were next made with substituted thiocarbamides, in order to ascertain whether they can form compounds with ammonium bromide similar to those obtained with the unsubstituted amide. The mode of operating was the same as in the cases already described in which definite compounds were produced, and each of the following mono and di-substituted thiocarbamides was treated with ammonium bromide.

$CSN_2H_3{\cdot}CH_3$
$CSN_2H_3{\cdot}C_2H_5$
$CSN_2H_3{\cdot}C_3H_5$
$CSN_2H_3{\cdot}C_6H_5$
$CSN_2H_2(C_6H_5)_2$
$CSN_2H_2(C_6H_5){\cdot}COCH_3$.



In no instance was any evidence of combination obtained, even under the most favourable conditions, the unchanged thiocarbamides crystallising out from the solutions along with the ammonium bromide used in these experiments.

Considering the number of substituted thiocarbamides examined, and the variety of radicles present, it is clear that the substitution of even one atom of hydrogen by an alkylic or allied group destroyed the power of the compound to combine with ammonium bromide; but it is to be noted that all the thiocarbamides used in the experiments were prepared by similar methods, and were, doubtless, of similar constitution.

C.—*Compounds of Tetrethylammonium Iodide and Bromide with Thiocarbamide.*

The last group of experiments having proved that the introduction of a single alcoholic radicle into thiocarbamide wholly prevented the combination of the product with ammonium bromide, the next step was obviously to ascertain whether the presence of similar radicles in the bromide destroys its power of uniting with unchanged thiocarbamide. Hence a series of experiments were made with the alkylammonium bromides and iodides, the ethylic compounds being those chiefly employed. I shall first describe the results obtained with the tetrethylammonium salts, the iodide being that first used.

Five grammes of pure tetrethylammonium iodide were dissolved in alcohol and added to an alcoholic solution of 6 grams (1 : 4 mols.) of thiocarbamide. The mixture was boiled for rather more than an hour. When cold, no crystals were deposited, though the solution was strong; it was therefore distilled down sufficiently and allowed to cool, when a mixed crystallisation was obtained, consisting of free thiocarbamide with fine, prismatic crystals of a compound of the iodide with thiocarbamide, which contained more iodine than is required even for a compound of only 2 mols. of the amide with 1 of the iodide, but no trace of any tetrathiocarbamide compound could be detected, nor was any obtained after further attempts at combination. As the evidence pointed to the production of a dithiocarbamide compound at most, a further calculated quantity of tetrethylammonium iodide was added, so as to secure the proper proportions in solution. On crystallisation after further heating, a fine crop of large, needle-like crystals separated unmixed with free thiocarbamide. But the appearance of the crystals and their manner of separating from solution presented no similarity whatever to the compounds of thiocarbamide with simple ammonium salts. The new substance was recrystallised from alcohol and carefully dried for analysis.

The melting point of the pure compound is 135°.

0·553 gram gave 0·644 $BaSO_4$.
0·3455 „ 0·1974 AgI.

The formula $(H_4N_2CS)_2(C_2H_5)_4NI$ requires—

| | Theory. | Found. |
|---|---|---|
| I ... ... ... | 31·0 per cent. | 30·85 per cent. |
| S ... ... ... | 15·6 „ | 16·00 „ |

There is, therefore, no doubt that a well defined dithiocarbamide compound (and possibly a 1 : 1 also) is formed with tetrethylammonium iodide, but no higher product was obtained, even in presence of a considerable excess of thiocarbamide.

Similar results to the foregoing were afforded by tetrethylammonium bromide; the single compound obtained separated in fine, rectangular prisms, which were sufficiently purified by one crystallisation.

The pure compound melted at 159-160°.

0·2845 gram gave 0·1486 AgBr.
0·3218 „ 0·399 $BaSO_4$.

The formula $(H_4N_2CS)_2(C_2H_5)_4NBr$ requires—

| | Theory. | Found. |
|---|---|---|
| Br... ... ... | 22·09 per cent. | 22·22 per cent. |
| S ... ... ... | 17·67 „ | 17·04 „ |

The solution from which this compound had separated was mixed with excess of thiocarbamide and heated for half an hour to boiling, but no traces of any tetrathiocarbamide compound was obtained in successive crystallisations from the liquid. The chloride seems to act in the same way.

Thiocarbamide, therefore, combines with the haloïd salts of ammonium and tetrethylammonium, but affords two perfectly distinct classes of compounds, differing alike in characters and in composition.

*(To be continued.)*

At a meeting of the Royal Society, Edinburgh, June 1st, Prof. Tait communicated a paper, by Prof. Piazzi Smyth, on two series of enlarged photographs, one in the visible, the other in the invisible of the violet of the solar spectrum. The paper was accompanied by the photographs. The observations include part of the spectrum as previously observed by Mr. Smyth in the summer of 1884, and extend to an extreme distance in the invisible violet. The previous observations were included in sixty plates; in the present series twelve more plates are added in the violet region, and two independent photographs of each part have been taken. The photographs agree with those of Prof. Rowland in indicating that the Fraunhofer line, "little *d*," is either entirely absent now from the solar spectrum, or has become very unimportant.

In Fear of the Photographer.—Speaking of Ramsgate, in "Seaside Resorts," the holiday number of the *Daily Graphic*, the writer says:—"The whole place literally bristles with photographers. You never know when you are being taken, or what compromising picture the photographer may have at this very moment in course of development. I have only been here thirty minutes, and have been most circumspect in my behaviour, as I always am, but fear to imagine how many times I may have been 'snapped off,' and I tremble when I think I may see these pictures for sale in the shop windows to-morrow morning. Surely one ought to be allowed to have a copyright in one's own face. I was only just now talking to Mr. Montagne Williams, whom I met on the pier while watching the arrival of the London steamer of the General Steam Navigation Company, and I wish I had asked him his opinion on the matter, for I see every chance of being involved in several actions with regard to copyright in my own countenance before I leave the township."

## COLOUR PHOTOGRAPHY.

Mr. Frederic E. Ives, according to the *Philadelphia Ledger*, made an important communication at a meeting of the Franklin Institute, on June 18th, upon the subject of his process of colour photography, in the course of which he explained and illustrated some recent improvements he had made in the means of operating the process, by which it is rendered comparatively simple and reliable, and capable of immediately profitable commercial operation for lantern illustration. When Mr. Ives first published his process, several years ago, the three negatives requisite were made in one camera from one and the same point of view, but last night he showed that, by an improvement on his heliochromic camera, the three negatives, represent- the effect of the object photographed upon the three fundamental colour-sensations, are now not only made from one point of view, by simultaneous and equal exposure, as they were three years ago, but also upon a single sensitive plate; so that the heliochromic negative is obtained with no more trouble than an ordinary one, and any number can be made in which the relation of one element to the others is exactly the same. The colour prints, also, can be made from these negatives by a single exposure in transparent gelatine, and separated only when ready to dip into the dye solutions representing the respective colour-sensations. Mr. Ives showed, however, that it is not necessary to go to the trouble of making the colour prints when only lantern illustrations are required. Lantern positives made from the heliochromic negatives with no more trouble than ordinary lantern slides were projected on the screen in the natural colours in the ordinary lantern, by means of a special front of Mr. Ives's own devising, and which was substituted for the ordinary projecting lens in about one second, so that an exhibition of ordinary lantern slides can be interspersed with projections in natural colours without causing any delays in changing from one to the other.

Several such projections were shown, including some admirable views in the Park, and they were received with prolonged applause. The approximation to the colours of nature were marvellously accurate. The positives were about one-third smaller than the ordinary projections, but were as sharply defined, and in as bright and true colours as those produced two years ago with the more elaborate and troublesome lantern. The lantern front used for these new projections consisted of three prisms, converging light from a single condenser and radient to three small projecting lenses, the necessary colour screens being located just behind the objectives. Mr. Ives also showed one of two cameras which he had devised to produce the heliochromatic negatives, in which three negatives are made on a single plate, the image-forming rays being transmitted to the single gelatine dry plate through three reflecting prisms, and from points of view so close together (less than half an inch apart) as to make perfect registration easy of accomplishment. By the other camera, the three negatives will be made from the same point of view. Mr. Ives also announced that he was at work on a scientific novelty in the form of an optical device for the table, in which these positives could be seen in the natural colours as readily as stereoscopic views are seen in relief in the stereoscope.

Mr. John Carbutt said that he considered Mr. Ives's latest work by far the most important and valuable contribution to the difficult subject of photography in the colours of nature which had yet been made.

# Patent Intelligence.

## Applications for Letters Patent.

10,662. LEWIS HUGHES, 4, Clayton Square, Liverpool, "Improvements in Lifters for Photographic Plates."—June 23rd.

10,665. WILLIAM TYLAR, 12, Cherry Street, Birmingham, "Improvements in Photographic Folding Plate Drainers."—June 23rd.

10,798. JOHN KERSHAW, 53, Arcade Chambers, St. Mary's Gate, Manchester, "Improvements iu Shutters for Photographic Cameras."—June 24th.

## Specifications Published.

1,098. *January 21st*, 1890.—"Chauge-Boxes." H. H. LAKE, Southamptou Buildings, Middlesex. (E. Kipper, 361, Broadway, and E. W. Perry, jun., 42, East Fourteenth Street, both of New York, U.S.A.)

The plates, &c., are placed in a box, and are pressed towards a flange in the front by a support actuated by a screw. The front plate, &c., is exposed by withdrawing a slide. The exposed plate is transferred to a receiving box, which may be hinged, or otherwise attached, to the first. The transference is effected by an open frame, the side bars of which have teeth, which, taking the edges of the plate, &c., carry the latter into a box. Springs, or a push, may be used to throw the plate, &c., off the teeth. The carrier frame is worked by a rack and pinion. A flap shuts the aperture in the partition or ends of the boxes through which the carrier passes. Modifications are described in which the plates are transferred by pinions which engage in the corrugated edgings of sheaths, in which the plates, &c., are held, or by friction wheels, &c. Also the receiving box may be in the rear of the holding box, the plates, &c., in transference passing through a curved guide, which may be provided with guide rollers. Lastly, the frame carrier may be actuated by a cord or rod, &c. The sheath referred to is formed by turning over, and forming teeth or corrugations on the edges.

1,155. *January 22nd*, 1890.—"Tripod Stands and Walking-Sticks." W. R. BAKER, 9, Belmont Villas, Wallington, Surrey.

Relates to camera stands, which may be also used as a walking-stick.

The legs, which are hinged or pivoted to the base of the superstructure on which the camera rests, form, wheu folded together, a walking-stick of circular section, the lower ends being secured by a ferrule, and the top by a tube of the superstructure, which serves as a handle. The superstructure consists of a triaugular base to which is screwed the tube carrying the camera board. The parts are detachable, but in a modification, in which the legs, instead of being pivoted, are hinged, the lower part is small enough to allow the upper part of the tube to pass over it when using the stand as a walking-stick. The provisional specification describes a modification of the superstructure, consisting of two triangles with connecting pieces, which is also adapted for being used apart from the legs.

1,203. *January 23rd*, 1890.—"Detective Camera with Change-Box Arrangement." D. CARTER, 15, Gerrard Street, Warwick.

The plates or films are fitted in sheaths, preferably of metal, and slid into vertical grooves till they rest on a platform fixed to the back of the camera. A frame slides on rails, and, after an exposure, it is pulled forward by a tape (which is marked to act as a register), till the exposed plate slips over the end of the platform, and falls forward into a store receptacle in the bottom of the camera. The frame is pulled back by elastic bands and held iu the correct position for exposing each plate by a detent acting on the teeth of a rack. A shield, which may be hinged, excludes light from the store receptacle. Several modifications of change-box arrangement are described. In one, a spring arrangement is used to break the fall of the exposed plate into the store receptacle. Wings are formed ou the sides of the sheaths to prevent them falling forward till they have reached the bottom of the store receptacle. In another form, the projecting ends of a wire fixed to the bottom of a sheath are pivoted in apertures in the peripheries of the end discs of a reel or roller. By turning the reel the plates are brought successively into position for exposure, and then folded down into the store receptables. Instead of moving forward the frame to bring the plates successively into focus, the front of the camera is connected to the body by a short bellows so that it can be moved backwards. The leus tube is fitted iu a tube fixed at right-angles to a plate which is pivoted so as to bring the lens nearer the base of the picture when the cameras are turned round. The shutter consists of two oscillating plates working in a slot in the lens tube, and actuated by a cam, on the axis of which is a grooved pulley turned by a cord connected to an elastic band at one end, and worked by a lever at the other. The finder consists of two parallel reflectors set at an angle of 45°, the lower reflector being convexed to correspond with the focus of the lens.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—By the kind invitation of Mr. John T. French, a very pleasant excursion of the above Society took place to Keston on Saturday afternoou last. The wind was against anything special being done. After tea, the wind having dropped somewhat, the company was grouped iu the valley, and Mr. Banks had a shot with the Club camera. On July 11th the Society will have an outing at Rochester.

DEATH OF MR. LACHLAN M'LACHLAN.—The Manchester papers devote more than the ordinary amount of space to obituary notices of this well-known photographer, and some of them give a long account of his career from his amateur days to the time when he was called upon to take portraits of the Queen and various members of the Royal family. From one of these notices we extract the following:—"About 1853-4 he commenced as a professional photographic artist in St. Ann's Square; subsequently having a studio very many years in Stamp Office Buildings, Cross Street, near the old offices of the *Guardian* aud *Evening News*. At the latter studio M'Lachlan made his first distinctive mark as the most artistic photographer in the city, a position, we may add, in face of many subsequent accomplished competitors, he maiutained to the last. As was once remarked: 'M'Lachlan is au enthusiast; and nothing but enthusiasm of the noblest order could have reached the goal which he has won. He believes in photography as au art; not in those caricatures at so much per dozen which can be had at any street corner, but specimens where the character of the man photoed can be plainly read.' In his Cross Street studio, M'Lachlan, assisted often by the high-class artistic advice of his great friend, Frederick Shields, turned out some splendid work, both of public and private characters; among the former capital photos of Mr. Charles Calvert as Richard III. and Shylock. His first really important public work was the fine photographic group of members of the Cotton Famine Relief Fund Committee, the portraits in which, especially of the late Lord Derby, the late Lord Egerton of Tatton, Lord Winmarleigh, &c., are as fiue as any ever produced by photographic art. Nearly twenty years ago M'Lachlan commenced, in a temporary photographic studio near Balmoral, the picture on which his uame and fame will hereafter rest—that of the Royal family. We remember him going off in hot haste to Aberdeen to get his first sittings of the Queen and other members of the Royal family, then at Balmoral. Of his theu experiences, and many subsequent ones in connection with that picture, which was really the labour, and, we may add, the bane, of the latter years of his life, no end of amusing stories have been, aud (now that he is gone) will be told. There was, however, one motto in this work which might be safely affixed to him—'Perseverantia omnia vincit.' As Sir Joseph Heron once said of him, 'Mac never knows anything about defeats or being beaten.' Apart from his profession, in which he certainly never knew a superior in Manchester, and apart from his long residence in Manchester, M'Lachlan was a typical Highlander, warm-hearted and generous, high-principled and honest, straightforward and above-board in all he said and did."

# Correspondence.

## THE BOSTON CAMERA CLUB.

SIR,—The next joint exhibition of the Photographic Society of Philadelphia, the Society of Amateur Photographers of New York, and the Boston Camera Club, will be given in Boston in the spring of 1892, and an item in your paper to that effect may interest your readers in Great Britain, especially those who are in the habit of exhibiting their work in this country.

The Boston Club has asked its members to work this season with that exhibition in view, and everything that can be done to make it a success certainly will be done.

*Boston, June 17th.* WILBUR C. BROWN, *Secretary.*

## ORTHOCHROMATIC PHOTOGRAPHY.

SIR,—Presuming that the report in your last issue of the discussion at the meeting of the Photographic Society of Great Britain is correct, I must ask you to allow me to make some explanations and corrections.

In the first place, I resigned my appointment with Messrs. Edwards some months ago, so that I have no longer the smallest possible interest in the patent referred to either directly or indirectly, so that I now have a free hand to investigate for myself without having it thrown in my teeth by writers (some of whom are interested in rival undertakings) that, as I was in the employ of the manufacturers of isochromatic plates, my opinions on the subject were not worth a rush. Now, as this explanation puts me *at least* on level ground with my critics, permit me to correct the misapprehension that your report will probably produce, as to what I actually wrote and think.

I did not in any way imply that optically-worked glass screens were first introduced by Messrs. B. J. Edwards and Co. I did not even mention their name in connection with optically-worked glass. What I did write was, "The best screens that I had seen, *so far as colour was concerned*, were those made in the form of a diaphragm, supplied by Messrs. B. J. Edwards and Co."

With all due deference, I claim to have had a wide experience of practical workers, and, therefore, I still hold the opinion that the "yellow screen bogie" has had a good deal to do with the apathy of photographers to the advantages of colour-sensitive plates. Another reason, doubtless, lies in the fact that those who have to earn their living by photographing have little time, and still less inclination, for investigation.

I have never said that the yellow screen is unnecessary *in all cases*, and I should feel obliged to anyone who will have the goodness to point out to me how, when, and where I said it. I have, however, frequently stated that the indiscriminate use of the yellow screen is to be avoided, and I am absolutely certain that, in many cases, a yellow screen is a positive disadvantage, and in this opinion I was supported by Mr. Gotz during the discussion at the P. S. G. B. on the 23rd inst.

A reference to my short paper read before the Society will show that I wrote :—"The yellow screen, far from being a terror, is a valuable tool which, when better understood and judiciously used, will enable photographers to reproduce the colours of nature in monochromatic values, which some painters might sneer at, but could never excel," or words to that effect, as I did not keep a copy of the paper referred to.

There are some other points in the discussion which I should like to comment on, but the foregoing is sufficient to show that my paper was not prompted by commercial interest, and that I am not opposed to the judicious use of compensating screens.

*Clifton Villa, Ilfracombe.* BIRT ACRES.

---

THE secretary of the International Photographic Exhibition which is to be held in Glasgow in September next, has sent us plans of the Galleries of the Institute of Fine Arts, in which the show is to take place, from which we are able to judge of the very large wall space which will be at the disposal of the committee. The principal room measures 95 by 33 feet, and there are five other smaller apartments in which pictures will be hung. The retiring rooms, lavatories, &c., marked on the plan show that the comfort of visitors will be looked after more than it often is at these exhibitions.

# Proceedings of Societies.

## NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS OF GREAT BRITAIN AND IRELAND.

A MEETING was held on June 25th at the Colonnade Hotel, New Street, Birmingham, to form a district branch of the above Association. Mr. H. J. Whitlock (Birmingham), president of the Association, who was in the chair, explained the objects of the Association, and heartly welcomed those present, expressing his pleasure at meeting members of the profession, and his belief that much might be done to advance their interests by friendly conference and interchange of opinion on various matters.

After further remarks by Mr. John Lewis, Herr Karoly, Mr. Harold Baker, Mr. Roland White, and others (all of Birmingham), a committee and officers were appointed, and the next meeting fixed for the 15th July next.

## RICHMOND CAMERA CLUB.

AT the meeting on the 26th inst., Mr. CEMBRANO in the chair, the "Development Competition," in which each competitor was required to develop two negatives of unknown exposure (one being under and the other over-exposed), was decided.

Mr. CEMBRANO acted as judge, and awarded the first place to Mr. Ennis for the under-exposed, and to Mr. Hunter for the over-exposed plate.

A discussion on the *modus operandi* of the competitors followed.

## HACKNEY PHOTOGRAPHIC SOCIETY.

A MEETING took place last Thursday under the chairmanship of Mr. J. A. SINCLAIR. Dr. Smith gave an account of the Dorking outing. Mr. J. O. Grant presented the Society with a set of dishes.

From the question-box : "How to get density in rapid plates."

Mr. HUBERT said it was necessary to modify development.

Mr. GRANT advised starting with soda and finish with hydroquinone.

Another question was put as follows :—"How to guide oneself in photographing interiors."

Dr. ROLAND SMITH gave a rule as follows :—Divide area of room in cubic yards by area of window in square feet. This gives results in minutes as a standard. Vary the stop according to light.

Mr. HUBERT showed the difference in development a plate makes by varying the bath. One was developed with pyro and ammonia ; the other was cut into two, and one half was developed with excess of pyro, and the other with excess of ammonia. The results showed, apparently, though equally exposed, correct, under, and over-exposure.

Dr. ROLAND SMITH then gave a demonstration of development, using pyro-ammonia, pyro-soda, hydroquinone and eikonogen mixed, &c.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

*June 25th.*—Mr. PAUL LANGE in the chair.

Mr. John Jarvis was elected a member.

The balance sheet of the Liverpool International Photographic Exhibition was brought up for discussion, and passed.

The thanks of the Society were tendered to Mr. T. S. Mayne, the exhibition hon. secretary, by whose arduous exertions the exhibition was carried through. The Society also asked Mr. Mayne to accept the sum of £50 as a mark of their appreciation of his efforts.

Attention was drawn to the arrangements made for the holding of the photographic convention at Bath in July.

The PRESIDENT stated that the Mersey Yacht Club regatta would be held the following Wednesday, when members intending to photograph the yachts would have special facilities by booking their places on the steamer *America*, which had been engaged to follow the yachts.

The PRESIDENT showed some prints of submarine explosions, taken by him recently outside the river Mersey during experiments of the Submarine Miners Division for the Defences of the Port of Liverpool. The principal picture taken illustrates an explosion of a 100 lbs. gun cotton charge, the column of water forced up rising to over 100 feet.

Mr. W. A. Brown then proceeded to read his paper, illustrated with experiments, on the "Chemistry of Photography."

---

Bath Photographic Society.

The first excursion of the season took place on Wednesday last to Bradford-on-Avon, Avoncliffe, and Winsley. The party left the city by brake early in the afternoon, making the first halt at Bradford railway bridge, where the surrounding scenery proved to be most suitable for practice. A brief stay was next made at the top of the Bradford Road. In Bradford the principal object of attention was the old bridge situated beyond the town. Bradford and environs are so picturesque that it is hardly advisable to attempt too much on any one visit; for this reason the party made all possible haste to the weirs at Avoncliffe in order to secure some views ere the light should be unsuitable. This done, the members were invited to the summer residence of the vice-president, Mr. Austin J. King. After an excellent repast, another very pleasant hour or so was spent in viewing the grounds and peeps of distant scenery obtainable therefrom.

---

Birmingham Photographic Society.

*June 25th.*—Mr. A. H. Carter, M.D., in the chair.

Messrs. Charles Barwell and L. Neal were elected members.

Dr. W. W. J. Nicol gave his paper on "Silver Printing" with the aid of iron salts. He fully described the process of No. 1 and No. 2 kallitype, processes invented by himself, and which, at the present time, he is still improving, going through the chemical technicalities with great detail, and finishing with practically demonstrating the development of the prints, which showed very fine depth of tone.

The Chairman said that, in photographic processes, both the technical and the practical should be known, and these Dr. Nicol had explained most thoroughly.

During the discussion which followed, Dr. Nicol, in answer to questions, said that, in printing from a thin negative, the quantity of bichromate in the developer should always be doubled; and that sepia tones could be obtained by the addition of borax in the developer. Printing by artificial light took too long a time; even with oxyhydrogen or electric light printing is very slow.

---

Kimberley Camera Club.

At the second annual meeting held in the Council Chamber on June 3rd, the following were elected office-bearers for the ensuing year:—*President*—Rev. Father Ogle; *Vice-President*—Mr. F. Skead, B.A.; *Hon. Secretary and Treasurer*—Mr. M. Macfarlane; *Committee*—Messrs. C. A. Chappell, J. Henry, G. D. Pieser, and F. Titmas.

---

Vienna International Photographic Art Exhibition, 1891.—The following circular has been forwarded to us:—"Vienna, May 31st, 1891. According to the rules of the International Photographic Art Exhibition, each exhibitor is to get a diploma of merit, and the jury has the right to advise the patroness, H.I.H. the Archduchess Maria Theresa, to award a very limited number of gold medals. In consequence of this latter rule, the jury has subjected the whole exhibition to a careful examination. The result is that it is found to be impossible, owing to the high merit of the pictures as a whole, and to the great equality of the several ones, to do justice by awarding medals, as of necessity some works must be passed by, which would not be justified, owing to their being so nearly equal to those winning medals. Therefore the jury has unanimously resolved that there shall not be double awards, medals and diplomas. But each exhibitor will receive a diploma bearing the name of the Archduchess, which, owing to the extreme rigour exercised in the selection of pictures for exhibition, is, in itself, an honour of great value.—A. Schaffer (president of the jury), F. Luckhardt (hon. sec. of the jury)."

# Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

J. W. (Shanklin).—*Colonial Agency.* We do not know of anyone standing precisely in the position of our mutual friend named in your letter, either in Vancouver or British Columbia; but you might make enquiries of Messrs. T. N. Hibben and Co., of Government Street, Victoria, B.C.; or Messrs. Hall and Lowe, Photographers, of No. 76 in the same street.

B. L.—*New Cabinet Cases.* The leather boxes are made to accommodate twenty-five or fifty photographs, and, whilst preserving them in the smallest possible compass, with very little surrounding air-space, there is only to be noted the disadvantage that the contrivance offers less defence against kleptomania as compared with the old albums, where the removal of a card shows at once an awfully conspicuous blank.

A. F. V.—*Standards of Colour.* With the view of adding precision, and securing the adoption of certain standards of colour for industrial purposes, the council of the Society of Arts has recently appointed a scientific committee to attack this subject, and report during the forthcoming session. Amongst others we find the names of Lord Rayleigh, Captain Abney, Dr. W. J. Russell, Professors Hummel and Meldola, Mr. Brudenell Carter, and Mr. W. Holman Hunt.

F. C. S.—*A New Alloy.* Prof. W. C. Roberts-Austen showed at one of the recent soirées of the Royal Society a beautiful pink alloy, which he prepared from 22 parts of gold and 78 parts of aluminium. Perhaps nearest to this in colour is the pale violet *Regulus Venus*, composed of copper and antimony in equal parts. This latter is a very brittle alloy, known since the days of the ancient alchemists.

J. G. B. (Nelson, N.Z.).—*Sensitive Films of Iodide of Mercury.* The anticipations referred to by Dr. Liesegang in the 1875 Year-Book, p. 39, do not appear to have been realised. We cannot find any account of Dr. Schnauss's process, nor is it mentioned in Dr. Eder's summary of facts bearing on the "Chemical Effect of the Spectrum," published seven years later by the Photographic Society of Great Britain. The action of light upon mercury compounds, excepting in conjunction with oxalic acid for actinometry, does not seem to have led to any practical applications, and, in sensitiveness, the mercury salts stand far behind silver.

T. M.—*Bellows Material in Hot Climates.* To ward off the attack of insects camphor is not always successful, and its volatility renders its action at best only temporary. Probably mustard oil or turpentine combined with an insecticide powder (Keating's) would be most effectual.

J. C. (Barnton).—*Ferrotype Plate.* You will find several pages devoted to the ferrotype process and materials in Mr. J. Fallowfield's "Photographic Annual" (London: 146, Charing Cross Road, W.)

F. R. M. S.—*The Rainfall for Six Months.* The amount for June was less than half the expected quantity, and the total for the past half-year is just under eight inches for North London, which is about two-thirds only of the average rainfall for that period.

Printer.—*Water Glass.* A light wash of silicate is said to be effectual for removing the greasiness, whilst hardening the surface of the litho stone. It is applied with a sponge just in the same manner as gum water. The potash salt is usually employed, although syrupy silicate of soda is more reliable on the score of chemical purity.

---

Photographic Club.—Subject for July 8th, "View Meters and Finders"; July 15th, "Meteorological Subjects." July 4th, outing to Claygate and Claremont; train from Waterloo, 2.27; meet at Claygate at 3.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1714.—*July* 10, 1891.

CONTENTS.



## DECEPTIVE PHOTOGRAPHS.

Photography is now used more than ever it was before in the service of advertising—a natural result, possibly, of the many excellent photo-mechanical processes which have been perfected during the past few years. There is hardly a single branch of trade which does not employ photography as an advertising medium, either in the form of illustrations to catalogues and price lists, or in the more public manner of framed advertisements in public places. The bootmaker, the hatter, the clothier, and others who minister to personal adornment, are only too eager to adopt a method which so truthfully describes their wares, for they depend for success upon the outward appearance of what they sell far more than upon any other property which their goods may possess. In our railway stations, in the waiting rooms and other offices – nay, even in the coaches themselves —photographs force themselves upon our attention, whether we want them or not; but, as they are generally of excellent quality, they are looked upon with both pleasure and interest by those who happen to be killing time in their vicinity. These pictures mostly consist of transcripts from nature of the scenery which is accessible by the particular railway in question, and no doubt many tourists are, on the spur of the moment, influenced by them to visit the places photographed.

So long as the photographer confines his attention to studies of hats, boots, or shirts, he cannot play any tricks. The said articles of attire certainly do not lend themselves to artistic treatment, but he does his best to group them in the least offensive manner, and to bring out their gloss and other leading characteristics to the best advantage; but there are subjects in which the photographer employed by the advertiser can give rein to his imagination to a certain extent, and can, by a judicious choice of lens, practise little deceptions which are useful to his employer, but which are apt to be resented by the general public. One or two examples of this kind of deception have occasionally come under our notice, and may here be briefly referred to.

At a certain railway station in Devonshire—we need not be more explicit—we saw advertised a particular hotel which was said to be situated in its own grounds, while the said grounds comprised a beauteous waterfall. As a proof that these statements were true, some half dozen photographs were displayed, and there, sure enough, was the boasted waterfall. We had no idea that such a massive fall of water existed in the county, and we straightway made up our minds to visit this natural wonder of the district. The hotel was not particularly easy of access; that is to say, although upon the map it was only a dozen miles away, the route to it by railway was not direct, and many changes of carriage occurred before we arrived at our destination. But we were comforted under all these difficulties by the certainty of reward when our journey was ended. Alas! for human hopes founded upon the promise of a photograph. The waterfall which we had imagined to leap from a height of forty feet or so was, in reality, a little stream which tumbled over a miniature rock about four feet high, while, to add insult to injury, a man had to be sent to turn on the water before it would even dribble.

A still more flagrant example of photographic fraud of this type we came upon more recently, and for aught we know it is still drawing the shillings from the pockets of simple folk like ourselves. Here again we must be cautious with regard to stating the exact locality, for the awful consequences of imputing in print wrong doing, even to heinous criminals, are, in this enlightened country, not to be lightly regarded. The place referred to is much visited by tourists, and its chief glory consists in a mighty pass between limestone cliffs. In these cliffs some years ago a series of caves were discovered, and as some of the chambers there were decorated with stalactites of curious form, the owner of the place resolved to admit the tourist to the wonders of his caverns on payment of one shilling. In order to bait the trap, a number of photographs are placed outside the entrance to the caves, and it was by means of these pictures that we ourselves were caught.

The pictures bore a well-known name, and they were capital specimens of photographic work. One showed a hall of pillars like the aisle of some noble cathedral, the capitals of the columns being lost in darkness. Another depicted a placid lake, with stalactite above meeting stalagmite below, both being reflected in the mirror-like surface of the water. Another picture showed the curious, blanket-like form in many folds which stalagmitic masses will sometimes assume. Altogether, the scenes depicted were so remarkable and out of the common that we needed no more persuasion to pay our shilling for the "open sesame" to this place of marvels. But where was the hall of columns which we saw in the photograph? Here it was, a little cabin of a place a couple of feet high—a hole in the rock, in fact, where these columns were done in miniature. Where the lake? Here it was in another corner, holding about as much water as a sponge bath, and covering about the same area as that useful domestic appliance. The whole thing was a miniature of what we had expected—genuine enough, no doubt, but increased from pigmy size to gigantic proportions by deceptive photography.

## THE PORTRAITURE OF THE SUN.*

BY JAMES MEW.

In a pamphlet published some ten years ago by Mr. A. Davanne, vice-president of the French Photographic Society, it was asserted that at the Kew Observatory, during the space of some dozen years, more than two thousand photographs of the sun had been produced, giving the elements necessary for the verification of the number, position, and dimensions of the spots and faculæ, or bright streaks of diverse form on the solar surface, especially near the edge of the disc. These faculæ seem to have grown larger since the time of Sir John Herschel. Davanne speaks of some of them extending to forty thousand miles in length and to four thousand in breadth. The spots, first noticed, probably, by Fabricius in 1611, led to the discovery of the sun's rotation by Galileo. They are of irregular form, size, and position; black, surrounded by a striated penumbra, presenting to some the appearance of the edges of a thatched roof. About these spots, of which the discovery has also been ascribed, like that of most other things, to the Chinese, an interesting and early notice may be found in *La Rosa Ursina*, published in 1626.

In the study of the sun's surface, the photographic method has a great advantage in the strength and permanency of its recording picture, and the consequent power of perusing it at leisure. The disadvantage is that great foe of astronomical observation, atmospheric undulation, which renders the sun's image tremulous and confused, except at occasional moments. By taking a large number of photographs and selecting the best, this difficulty may be in some measure obviated. Janssen has taken pictures of the sun up to fifteen inches in diameter. In these the coarsely mottled corrugated surface of the photosphere is shown with much distinctness. Those luminous masses representing rice grains, or nodules, or oblong willow leaves, or blunt arrow heads, or feathers of a duck's wing, or trapeziums with rounded corners, or "things" two or three or even five times as long as they are broad, according to the imagination of the observer, are shown by these photographs to be of different sizes and splendour, which may arise from their different depths, or from bodies analogous to atmospheric clouds. This shape is commonly elliptic, but is subject to considerable variations. They tend, says Janssen, to sphericity, but are deformed more or less by gaseous currents.

Professor Rowland tells us that the spectra of all known elements—with the exception of a few gaseous, and some too rare to be yet obtained—have been photographed in connection with the solar spectrum, and that the greater part of the lines in these photographs has been identified, and the substance producing them noted. He has also presented us with a rough table of some two score solar elements, among which attention may be called to silicon, vanadium, scandium, yttrium, zirconium, glucinum, germanium, and erbium as possibly new. Arranged according to intensity, calcium occupies the first place in these sun elements, and potassium the last. Potassium is also the last if they be arranged after the number of lines in the spectrum, but the first is iron. Ruthenium, tungsten, with some half-dozen others, are classified as doubtful elements. Antimony, boron, gold, rubidium, thallium, and praseodymium, with some ten more, are said to be absent from the spectrum, while bromine, fluorine, holmium, thulium, terbium, &c., are substances not yet tried. "On the whole," says Professor Rowland, "were the earth heated to the temperature of the sun, its spectrum would probably resemble that of the sun very closely." But its inhabitants would, under such circumstances, cease to be interested in spectrum analysis.

Another proof of the scientific value of photography is in the establishment, through its assistance, of the fact that the glory of the sun, called the corona, circling sphery fire like the crown of soft, silvery light set about the heads of their saints by the artists of old, noticed as far back as the time of Kepler, and attended by its tongues or protuberances of rosy flame, is not any result of a lunar atmosphere, or a terrestrial phenomenon owing to the passage of the rays of this, our bright particular star in the galaxy through our earthly air, but a real and true appendage of the sun.

During the solar eclipse of August, 1869, the first piece of adminicular evidence touching the sun's corona came from the dark walls of the camera. Of the corona as well as the chromosphere, or chromatosphere, or sierra, the telescope ordinarily shows nothing. This is visible only during total eclipses or by aid of the spectroscope.

The photographs of the eclipse of July, 1878, show that the corona is not a mass of milky light, as it commonly appears through small telescopes, but has a hairy structure. Its outer limit is very irregular, resembling long tufts of flax. The *Bureau des Longitudes* of 1884 contains a photograph, neither retouched nor enlarged, of the corona during the eclipse of May, 1883, by M. Janssen. The picture was taken with a lens eight inches in diameter; the exposure lasted five minutes. The photograph shows a more extended corona than was visible in the telescope.

In August, 1887, photographs were taken in Russia and Japan, with plates of the same make, and probably of the same emulsion, with the same exposures, and developed by the same operator. In the next total eclipse visible in England, in the extreme north, just after sunrise, in 2290, the majority of our readers will feel comparatively faint interest.

* Concluded from page 482.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

PHOTO-ENGRAVING IN HALF-TONES—MEASURING THE SPEED OF DROP-SHUTTERS—A NEW ACCELERATOR.

*Photo-Engraving in Half-Tones.*—Herr E. Ammann describes, in the *Phot. Archiv*, a process of making grained negatives, by which an ordinary negative may be employed and converted directly into a grained one. It is only necessary that the negative be clear and without signs of fog, and that it show sufficient density, negatives of such qualities only being suited for the process in question. The negative, which should not be varnished, is coated with a four per cent. solution of plain collodion, to which a few drops of castor oil have been added, when it is placed aside to dry. After the negative has dried, it is coated with the well-known solution of gum-arabic and bichromate, as generally used in the dusting-on process. In my own experiments with this process the following formula answered well:—

| | |
|---|---|
| Water ... ... ... ... ... | 100 c.c. |
| Sugar ... ... ... ... ... | 10 grammes |
| Gum-arabic ... ... ... ... | 10 ,, |
| Bichromate of ammonia ... ... | 4 to 5 ,, |

This solution must be well filtered, and not kept for too long a time. After coating, the layer is allowed to dry at a temperature of from 122° to 140° F. After about ten minutes it will dry with a high gloss, and whilst still warm the plate is exposed beneath a glass screen with pure black lines and clear transparent spaces in an ordinary printing frame in direct sunlight. One minute will be sufficient for exposure in most cases. The plate is then developed by means of a large, soft dust-brush, and with very finely-prepared plumbago. When the grain has attained the required depth, it is necessary to wash the negative thoroughly in order to remove the bichromate from its film, since otherwise spots would be produced in drying. This elimination is best done by means of a solution of 2 parts of caustic potash in 100 parts of water, in which the negative is allowed to remain until the yellowness has entirely disappeared. The grain printed-in in this manner on the negative adheres tightly to it, after which the negative simply requires to be varnished.

*Measuring the Speed of Drop-Shutters.*—The various methods of measuring the speed of drop-shutter exposures which have been suggested from time to time may be divided into two classes. The one consists in the direct measurement of the action by photographing with the shutter a glaring point in rapid motion, the speed of which is known; the other consists in the direct measurement of the speed of the shutter, generally by using a vibrating tuning-fork registering a curve on the blackened shutter during its passage. A simpler and much more certain method, which requires no specially constructed apparatus, has been published recently by Professor Leonhard Weber in the *Phot. Mittheilungen*. It consists in the following. One-half of a dry plate is exposed exactly one second to an uniformly lighted shining surface, with a given stop and a given lens. Then the other half of the dry plate is exposed to the same surface by means of the shutter, strip by strip, the time of exposure in each case being slightly prolonged, the arrangement of the camera being, however, the same as before. After development of the plate, it must be ascertained which of the various strips of the one half—in other words, what number of instantaneous exposures—shows the same density as the first half of the plate, which was exposed for one second. To effect this experiment an ordinary dark slide may be used, arranged as follows. A thin but opaque cardboard is cut up so that it fills up exactly the space of the dark slide destined for the dry plate. A longitudinal incision is then made exactly through the centre of the cardboard down to about one centimetre distance from the lower edge of the cardboard, and from this point a right-angled incision sideways to the lateral edge of the cardboard. The piece included by the incisions is then cut off, so that one-half of the plate is laid open. After this half of the plate has been exposed the cardboard is turned over, leaving open the previously covered half of the plate; the cover of the dark slide is then withdrawn for about one-sixth, and the drop-shutter released ten times successively; then the cover is again withdrawn for one-sixth, and the shutter released again ten times, and so on. After development, one-half of the plate will show an uniform darkening of its film, the other half, however, six strips of successively increasing darkness. It must then be stated at what point between the instantaneously exposed strips the darkening of the film corresponds to that of the timely exposed half, when it will be possible to estimate even by one-tenth. The source of light must, of course, be a constant one during the whole series of exposures.

*A New Accelerator.*—For some years, a solution under the name of "Excelsior" has been sold in Germany, which was recommended by its inventor, Captain E. Himly, as an accelerator in ferrous oxalate development, as well as in pyro development, and which, at the same time, was said to prevent the lights from becoming hard in developing, and to bring out more detail in the light tones of the negative. As far as I am aware, the addition of this composition has answered well in the hands of those operators who have used it. I am glad to see that Captain Himly has now published the formula of his new accelerator, and, according to the *Photo. Archiv*, it consists in the following. Two solutions are made:—

*Solution A.*

| | |
|---|---|
| Water... ... ... ... ... | 500 c.c. |
| Zinc filings ... ... ... ... | 100 grammes |
| Sulphuric acid ... ... ... | 50 drops |

Sulphurous acid is formed by the above. The solution is well shaken, and kept for some days in a well-stoppered bottle. Then are added:—

| | |
|---|---|
| Sodium sulphite ... ... ... | 250 grammes |

After this has dissolved, the solution is again kept for some days in a well-stoppered bottle.

*Solution B.*

| | |
|---|---|
| Water... ... ... ... ... | 500 c.c. |
| Sulphite or sulphate of ammonia ... | 250 grammes |

The solution is filtered, and solution A mixed by equal parts with solution B. This mixture forms the stock solution. If it is intended to use it in combination with the pyro developer, it is necessary to add 1 gramme of sulphocyanide of ammonia to each 50 c.c. of the stock solution. If it is, however, intended to use it as an addition to the ferrous oxalate developer, 4 grammes of citrate of iron and ammonium should be added to each 50 c.c. of the stock solution. The solutions must be all well filtered. For developing with pyro, the "Excelsior" solution should always form 2½ per cent. of the whole quantity of the developing fluid; in developing with ferrous oxalate, however, it should amount to 5 per cent. of the whole bulk. If more be taken, yellow fog will result. Both preparations will keep for years, if filtered from time to time, and they be kept in well-stoppered bottles.

## PLATINUM TONING.

BY M. BRUNEL PAUL.

The divers formulas for toning silver prints have, up to the present time, been objectionable on account of giving a bath of but little permanence. Now the chloride of sodium giving stability to the chloro-platinites used in toning yields good results, as practice has shown. In consequence I was led to compose the following formula :

| | |
|---|---|
| Chloro-platinite of soda ... ... | 2 grammes |
| Chloride of sodium ... ... ... | 2 ,, |
| Bitartrate of soda ... ... ... | 1 gramme |

Dissolve cold in one litre of distilled water. The bitartrate of soda added to the present formula serves to render the bath slightly acid ; toning cannot be obtained in alkaline baths. A bath thus prepared keeps for a long time without decomposition, and gives very beautiful tones. To make use of it, it suffices to plunge the prints, previously separated, in water. First we obtain tones that are purple, brown-purple, brown, and finally of the brilliant black of India ink. The print should be removed as soon as it reaches the point of the tone desired, as in drying it becomes darker. If it were allowed to remain too long a time in the bath, it would become grey, dull, and without relief. Coming from the toning bath, place in a bath of hyposulphite of soda at twenty per cent., followed by abundant washings. Once dry, the print is unchangeable, and has a black tone of a most beautiful effect. Landscapes toned by this process are especially beautiful. This toning succeeds with all the sensitive papers furnished by dealers: albumenised, salted, &c.—*Photo. Gazette.*

Photographic Club.—On July 15, Meteorological subjects will be discussed ; July 22, Report of Convention Delegates. Saturday outing to Kew Gardens ; rendezvous at Kew Gardens Station at 3 p.m.

Copyright Law.—From a letter of inquiry received at the Treasury Department, it is inferred that some persons think the copyrighting here of a photographic reproduction of a foreign painting or other work of art bars any later comer from the priviledge of photographing the same thing and copyrighting his works. Librarian of Congress Spofford, who issues all copyrights, said that this was a decided mistake. Any person who chooses to secure a copyright of a photograph of the work of a foreign artist can do so by making application and paying the fee. That will prevent any other person from reproducing the copyrighted photograph, but it does not hinder anybody from taking an exactly similar photograph of the same painting and getting his photograph copyrighted. Mr. Spofford said that his duty in issuing copyrights was purely ministerial, and he has nothing to do with the question of infringements ; but he is, of course, thoroughly familiar with copyright law. Mr. Spofford pointed out that the uniform decisions of the courts have been that infringement of copyright is the appropriation of the work of the person protected by copyright. The copyrighting of a city directory, for example, prohibits any other publisher from taking the names from the directory and publishing them, but it does not prevent him from collecting the same names, publishing them in the same alphabetical order, and obtaining a copyright for his work. So the person seeking to copyright a photograph must not, by reproducing some other person's photograph, appropriate that person's work. He must take the photograph himself. The new copyright law makes no change in this respect.—*New York Times.*

## PRELIMINARY, SECONDARY, AND SUPPLEMENTAL LIGHTING.

BY DR. J. M. EDER.

At a recent meeting of the Photographic Society of Philadelphia, Mr. J. F. Sachse read a paper with the above title, being a translation from Dr. J. M. Eder's "New Exhaustive Handbook of Photography" (Part 2, Vol. I., pp. 313-320). The reader said the subject will, without doubt, be a revelation to the professional and amateur who knows nothing beyond the commercial dry plate of the present day. In days gone by the proceeding was technically known as "flashing." Our object in reproducing the article in its entirety is a two-fold one ; first, to call the attention of our readers to the exhaustive nature of Dr. Eder's labours ; and secondly, to recall the possibilities of this almost forgotten method of bringing out a negative which would otherwise be lost or valueless. In our own experience we have frequently resorted to this practice, and have rarely lost a plate. Whenever we find a plate undertimed or coming up too slowly, we simply pour off the developer and expose in the tray from two to ten seconds before the ruby glass, then again pour on the developer. In extreme cases we have repeated the operation as often as four times, and almost always with satisfactory results. Again, when we had reason to believe beforehand that we were undertimed, an exposure of two-thirds second in front of the ruby light before development proved of service. The former plan, however, is by far the safest. It is a proceeding, however, which requires care and judgment, and should not be resorted to unless all other manipulations of the developing agents fail to be effective. Still, in our own practice, the method as stated has proved successful with at least three makes of dry plates of varying degrees of rapidity.

*(a) In the Negative Process.*—If a Daguerreotype plate, wet collodion, or gelatine dry plate, after a short exposition in the camera, is subjected to an exposure of several seconds over the whole surface in a weak, diffused light, a favourable result will be attained.

If the exposure in the camera was gauged so short that the development resulted in an imperfect image, this supplemental general lighting continues the first action of the light so far that it results in a substantially better or perfect picture. This action was first noticed over forty years ago with Daguerreotype plates. Becquerel credited this continued action especially to the red and yellow rays, and denominated them as *continuing rays* (*rayous continuateurs*) ; while to the green, blue, and violet rays he attributed the primary cause of the action, and called them *creative rays* (*rayons excitateurs*).

This view was, however, soon found to be erroneous, and Moser was one of the first who recognised the fact that all the rays can commence and complete the action ; later, it was even proved that, in actual practice, it was just the subdued rays of the violet end of the spectrum which were the most active.

In the photographic practice, it has been repeatedly proposed to expose the plate in the camera for a shorter period than called for by ordinary conditions, and then subject the plate for a short time to a diffused light. This proceeding is called secondary lighting.

A similar effect is attained if the plate is subjected to an exposure of a weak diffused light before being placed in the camera (preliminary lighting), or if weak diffused light is introduced into the camera during exposure (supplemental lighting). In all three cases, a reduction of period of exposure in chief is gained, frequently, however, at the expense of the quality of the picture. The means, therefore, are manifold, and are described below.

As early as 1871, Schultz-Sellack declared that the "continuing" action of the light upon a weak image was not a peculiar phenomenon, but the result of the necessary primary action, which explanation contains the greatest probability.

1. *The Wet Collodion Process.*—The action of preliminary and secondary lighting upon the photographic wet collodion plates was discovered by Bazin in 1870. His plan was to introduce a red light on the plate either during, before, or after the exposition. This was done by aid of four openings in the front board of the camera, around the lens; these were protected with glass plates, coated with a solution of carmine in ammonia, which were placed in front of a piece of brown glass. The opening or closing of the lens achieved the same effect upon the four supplemental apparatus. The same effect was obtained when the plate was exposed to a red light, a second either before or after exposure.

Cary Lea, in landscape photography, caused the red light to strike the plate only where the sky did not reach. His plan was to secure a red medium (carmine-stained paper) on the upper part of the camera, so as to cause the darker portions, foliage, &c. (but not the sky) to be strengthened by the red light, and come out stronger in detail. When the foliage was brightly illuminated the red medium was unnecessary.

Newton applied an opening in the first board of the camera, 2 by 5 inches; this was covered with a green glass, so that the plate was flooded with a weak green light during the exposure. This is said to have reduced the time of exposure from twenty to five seconds.

Newton, however, concluded that the best and safest plan was to leave the plate in the camera, and then give a secondary exposure by taking a green, red, black, or grey medium in front of the lens, and thus reflect light upon the plate.

Others, again, exposed the wet plates one-third to one-fourth of the usual time; these introduced a piece of yellow glass in place of the dark slide, and subjected the plate to an exposure of ninety seconds in diffused daylight (Gaenslin).

Coloured papers (blue, green, brown) were also used for the same purpose, in front of the open lens immediately after the exposure (Krüger).

In the year 1887 the secondary lighting by means of violet light was recommended. Scotellari made an opening in the cap of the lens; this he covered with aniline violet. This opening was opened or closed at will by a rotary disc. The plan was to expose with open lens as usual, only much shorter, then put on the cap and turn on the violet light to complete the exposure. This process reduced the time from fifteen to seven seconds; this was exclusive of the supplemental lighting of two seconds.

Gillard recommended these coloured diaphragms not only for a reduction of the time of exposure, but on account of the peculiar mezzo-tint effects. He used diaphragms made of gelatine sheets, which were coloured violet or dark green.

Frequently the preliminary or secondary lighting was made by a white light. Werge used two thicknesses of tissue paper, giving four seconds.

Haugk suggested to expose a trifle less than half the usual time, then for a few seconds (say one-fifth of the usual time) to hold a piece of ground-glass before the lens, and then cap.

Melchion in portraiture exposed his wet collodion plates to a diffused light for two seconds by holding a ground-glass in front of the lens, and then made a normal exposure of eight seconds, the result being a plate equal to an exposure of fifteen seconds without any preliminary lightening.

Foxlee also was a strong advocate in favour of supplemental lighting with diffused white light. It was further recommended to have an opening in the cap, covered with opal glass, this to be two-thirds the diameter of the lens; the preliminary lighting to be one-seventh of the normal, with the result of reducing the actual time of exposure from twenty-four to fourteen seconds.

Richard closed the opening in the cap with a thin piece of tissue paper. The supplemental lighting should not exceed three-fifths of the normal time.

Wyler preferred to make the preliminary or supplemental lighting by candle-light in the dark room, as he had more control over the exposure than in the camera. His plan was to expose the wet plates for ten seconds to the candle-light.

Chapman subjected his astronomical plates to the influence of lamplight before he started development. This was also recommended by Wortley. With under-exposed wet collodion plates Prümm found that the most practical supplemental exposure was to flood the plate with a yellow light in the dark room.

It is requisite with both fore and after-exposures to take the greatest care that the light does not act too long, as this results in fog; while too short an action shows no improvement whatever. For instance, where an exposure under yellow glass of ten to fifteen seconds in diffused daylight already causes fog (wet collodion plates), a ruby glass with five to ten seconds under the same conditions gives perfect results, whereas a combination of the ruby and yellow glass, even with lighted exposure, gave no noticeable effect whatever.

These additional exposures, notwithstanding the occasional results obtained, can only be depended on as a makeshift to save an under-exposed plate, as in almost every case fog results. Further, properly exposed plates are always preferable.

Quidde preferred the subsequent exposure.

A considerable reduction of the light is necessary with all the nodalities of additional lighting, so that the proceeding can be controlled. Therefore, translucent mediums can only be used when violet or white light is used. When green or yellow discs are used, more transparent mediums are available, thanks to the fact that the colours admit but few of the active rays. It will be noted that in all these processes the blue and violet rays are the most active, red carmine paper admitting even a few of these rays. Plain red or yellow glass proves ineffectual.

In this connection we will introduce the proposal made in 1850-51 to use white for photographic purposes. This idea originated with Löscherer, in Munich, who always operated with a camera the inside of which was white instead of black. He declared that thereby the action of the light was greatly increased.

*(To be continued.)*

## COLOURED COMPENSATING SCREENS.*

BY BIRT ACRES.

I BELIEVE that the principal reason of the apathy of photographers generally to the great advantage obtained by using plates corrected for colour lies in the fact that they have been frightened by the "Yellow Screen Bogie." Every photographer who is worthy of the name recognises that the ordinary processes of photography do not give correct colour values, but many refrain from using orthochromatic or isochromatic plates because they have read that they will not work without a screen; and just to give an idea of how vague are some of the existing notions of the use of screens, I was once asked which was the best place to put the yellow screen in making an enlargement from an isochromatic plate.

Coloured compensating screens, far from being a terror, are powerful tools, which, when rightly used, will enable the photographer to render colour values in a manner which some artists may sneer at, but will never excel.

The indiscriminate use of a screen is often worse than having no screen at all. If a plate is highly corrected for colour, then a yellow screen is not necessary in general landscape work, particularly when working without the sun, such as in glens, interiors, &c., although in bright sunshine the screen is a distinct advantage, as it cuts off a good deal of the white reflected light.

Another stumbling block to the tyro was the abominations that have been sold as compensating screens for photographic purposes. Most of them were worse than useless from being of an unsuitable colour, too deep in tint, and of unequal surfaces and thickness.

It is a *sine quâ non*, as everyone knows who has had any experience in this class of work, that glass screens to be used before or behind the lens must be optically worked, so that the two faces, in addition to being perfect planes, must be absolutely parallel to each other.

The question of colour is a much more difficult one. A pale orange tint answers excellently for all general purposes, but, in my experience, a lemon-yellow colour is the best where a great variety of colours has to be dealt with. Green or greenish yellow is, in my opinion, worst of all.

The best method—in fact, I may say the only method—for testing screens for colour is by means of the spectroscope. Thus, a green screen will be found to absorb red and orange, as well as blue and violet, rays in proportion as the green partakes of a blue or yellow character. The more it approaches blue in colour, the more red and orange will be absorbed, whilst if of a yellow green colour, more blue rays and less red and orange will be absorbed. Even a greenish tinge in glass has a very sensible effect in absorbing orange rays.

The effects noted above are equally apparent when the screens are tested photographically; and further, with green screens, there is a decided lowering of tone in the green, unless it just happens that the green to be photographed is identical in tints with the compensating screen employed, for if the green to be photographed approached to yellow in tint, and the compensating screen was of a slightly blue green, then the blue of screen would absorb the yellow of subject, and so *vice versâ*. For the foregoing reasons, I have arrived at the conclusion that, except for special work, a green screen is of no practical use.

A pale orange-coloured screen—one that increases the exposure about two or three times—will be found valuable for general work. The violet and blue rays are partially absorbed without seriously interfering with the green, orange, and red rays, but when it becomes necessary to cut off the whole of the blue and violet rays, thus requiring a screen of deeper tint, then the orange colour is not so suitable, as it absorbs part of the less refrangible rays.

The orange screens are, however, the only really serviceable glass screens at present in the market. There are no pure yellow glass screens manufactured that I am aware of. Doubtless, when photographers wake up to the advantages of using colour correct plates, and the demand warrants it, a suitable glass will be manufactured. Unfortunately for photographers, most of the coloured glass at present produced is made for decorative purposes.

The most perfect screen, so far as colour is concerned, that I have yet seen is that made in the form of a Waterhouse diaphragm, and supplied by Messrs. B. J. Edwards, of Hackney. The aperture of the stop is covered with a thin lemon-yellow medium, which absorbs the violet and blue rays, without appreciably affecting the other rays.

* Read before the Photographic Society of Great Britain.

## THE MOON.

AT a recent meeting of the British Astronomical Association, London, Mr. T. Gwyn Elger read a paper on "The Lunar Walled-Plain Ptolemaus," which was illustrated by lantern slides. After describing the telescopic aspect of this magnificent circumvallation under a low sun, and the more prominent details which may be seen under these conditions, even in a small achromatic of $2\frac{3}{4}$in. or 3in. aperture, he said that it is an hexagonal shaped enclosure some 115 miles in diameter, the area of the floor being about 9,000 square miles, or approximately equal to the combined areas of the counties of York, Lancashire, and Westmoreland. Its dimensions are so great that, were it possible for anyone to be stationed on the floor near the centre of the ring, he might easily imagine that he was standing on a boundless plain, so long as he looked only to the north, east, or south, as not a peak or any indications of the existence of the complex and massive border would be visible.

Even on turning westward, one object only would break the monotony of the horizon, and this the upper one thousand feet of the great peak *n* (nearly 8,700 ft. in height) on the western wall. The rough, rocky barrier of Ptolemaus is broken up by many longitudinal and cross valleys, and abounds in depressions large and small. On the northwest there is a wide, bright plateau falling gently towards the border, which, among other interesting features, includes a very noteworthy crater row running from the wall to the S.E. side of a large crateriform depression, Hipparchus *r*, which has two deep contiguous craters on its S.W. side. The late Rev. Prebendary Webb found that the direction of this crater row was continued down the eastern slope of *r*, by a delicate cleft, now called "Webb's Furrow." Hipparchus *r* has a central mountain, easily visible under a moderately high sun. The shadow of the mountain *n* is very conspicuous and beautiful at sunrise, when the three peaks which surmount it may be well observed in very "common telescopes," and the crater near its highest point is very clearly visible on the wall in instruments of moderate aperture. The north and northeast border, and the neighbourhood of Herschel and Herschel *d*, include a vast amount of detail hitherto unrecorded, but which will be mapped and catalogued in the monograph of the formation which is being prepared under the auspices of the Association.

The floor, in addition to the many craterlets and saucer-shaped depressions and low ridges visible thereon, is traversed by a system of light markings and associated light spots, even more remarkable than those discovered in Plato, Fracastorius, and Archimedes. Between January 1881, and August 1883, Mr. A. Williams recorded at least eighty-five of these faint, light streaks, which objects will, of course, receive the close attention of the section, with a view to confirm his observations. The hexagonal shape of the border of Ptolemaus is far from being a solitary instance of the tendency to a six-sided figure among the larger class of walled and ring plains. The same peculiarity may be noted in the case of Copernicus, and in many other of the so-called rings, large and small. The explanation of this, and also of the fact that arrangement of the mountains and highlands of which it is made up have, in many places, no apparent relation whatever to the contour of the floor (a structural condition also not confined by any means to Ptolemaus), may be left to the ingenuity of the framers of hypotheses. In describing the eastern wall, Mr. Elger referred to a remarkable gap in it, where, for a distance of three or four miles, there is no barrier at all between the floor and the outside country. In conclusion, he contended for the importance of the observer acquiring a correct appreciation of the actual size of the formation he studies, so as not to underrate the true significance of details. He also urged the members of the section not to attempt to draw more of Ptolemaus, or any other formation, than they can reasonably hope to finish during the course of three or four hours' observation, and to devote themselves to a limited area, or their work would not possess any great selenographical value.

Mr. Green then gave a paper on "The Lunar Seas," which was also illustrated by means of the lantern. He said: On examining a map or photograph of the moon it will be evident that these seas follow a definite order of arrangement, the smaller being near the limb, and the larger nearer the centre of the disc. There is not a single instance of these dark areas extending to the limb, and although large craters may be found there, and larger still are revealed by libration, they are not filled with dark matter like the seas. It should also be observed that, even when the dark formations come very near the limb, as on the north-east, there is still an unbroken line of bright surface beyond them, so that we have no reason to expect that similar blotches exist on the side turned from the earth. The brighter portions of the lunar surface are separated most definitely from the seas by being higher, more detailed, and to a great extent covered with crater-like forms. The seas, on the contrary, are lower, comparatively smooth, and craters few and far between. The question then arises, which of these two so widely diversified surfaces is the older? It has been supposed by some that the seas represent the more ancient state of our satellite, and that the crater-covered surface has encroached on them; yet this cannot be the case, for the shapes of the seas would then have been that of the spaces left between invading circular forms; but this is not the case; the seas tend greatly to circles, and press forward into the crater-covered surface with a fairly even line, broken occasionally by the remains of partly destroyed craters. Mr. Green illustrated this point by drawings of Fracastorius, the ruins of the north wall of which, he pointed out, could be seen under favourable circumstances, and of Doppelmeyer, Gassendi, and the Sinus Iridium.

He also showed how the base of the Apennines appeared to be fringed by great masses of débris, which seemed to have fallen from their summits. He then resumed: Thus far we have found that the lunar seas are comparatively a recent formation, that they increase in size from the limb towards the centre, and that, in all probability, they exist only on the side which is turned towards the earth. These circumstances point conclusively to some terrestrial influence in their formation, and for such influence we shall not have long to seek, as it will be found readily in the power of gravity and its tidal disturbances. Time was, doubtless, when the moon had an axial rotation, and when, in consequence of a semi-fluid state, the attraction of the earth raised upon her surface a considerable tidal projection. This wave, by friction and other retarding causes, eventually reduced the rotation, till at last the moon presented the most heavy side towards the earth, and her rotation as a free movement ceased to exist.

Then came the formation of the seas. The still liquid interior, in obedience to the powerful attraction of the earth, welled up through every crack and opening, choosing, of course, the weakest places, and, spreading on the surface, reduced it again to the semi-fluid condition, where now it is to be seen in the various forms of these lunar seas. It need not be supposed that these irruptions rose to a higher level than the older cratered-covered surface; but that the heated mass cut its way into the general surface which it undermined, and gradually reduced the fallen portions. An example of this may be seen on the eastern edge of the Apennines, near Archimedes. The possibility of this remelting process is evident from the frequent cutting of one crater form into another, portions of the older crater being thoroughly destroyed by the contact.

Mr. Alex. J. G. Adams said: The idea that, owing to tidal action by the earth, lunar seas exist upon the side facing us only, was not quite clear to him. Were we to assume a single tide alone? The effect of gravitation was the production of two tides in a line with the disturbing body, and he thought this state would apply to the moon. Moreover, while in no way detracting from the general hypothesis, and while fully allowing for cleanness at the disc edge, the probability of double tide carried with it the idea of seas upon either side of the moon. The point of tidal lag had been touched upon and deserved further remark. Our tidal effects were always in rear of causation, and in some cases there appeared to be a harmonic give and take, as exampled by the fact that, whereas the spring tides lagged more and more each spring lunation, the neaps gained, insomuch as to produce occasional overlapping. In the case of the moon, however, it was probable, owing to coincidence in her periods of orbital and rotative motions, that her tidal lag would be comparatively fixed, and seemingly just such as to produce decrease of sea upon her western limb.

Croydon Microscopical and Natural History Club (Photographic Section).—On July 4th a large assortment of negatives and prints was exhibited by members, taken during the recent excursions. The half-day excursion to Erith and Greenhithe for July 25th has been altered to Kingston-on-Thames; trains from Clapham Junction 2·15 and 2·55 p.m.; Waterloo, 2·5 and 2·40 p.m.

## Notes.

If a certain telegram may be believed which came from Vienna the other day, the price of platinum must speedily sink to its old level, for, according to the missive referred to, its principal employment in the manufacture of incandescent lamps is threatened by the rivalry of other less "noble" metals. According to this authority, we are told that "the electrical world of Vienna is greatly excited over the discovery by Captain Franz Walter, lecturer at the Military Academy, of a method of amalgamating glass with other metals than platinum. The invention, which has been patented in every country in the world, will effect a revolution in the manufacture of electric lamps, which will be immensely cheapened by it, as the use of platinum will be entirely discarded."

We are inclined to regard this announcement with a certain amount of distrust, as we are all apt to do in the case of any statement which bears evidence that the author is unfamiliar with his subject. Platinum does not form an amalgam with glass, and we do not see what end would be gained, in the manufacture of incandescent lamps, if it did so. Its value in relation to glass is found in the circumstance that, under the influence of heat, it expands less than any other metal, and that its expansibility is about equal to that of glass, so that a platinum wire can be carried through and sealed into the side of a glass vessel, and can be used as a carrier of an electrical current from the outer air into that vessel. The incandescent lamp globe is exhausted of air, and, without this means of metallic communication from the outside to the inside, it would be useless. If a method has been found by which baser metals can be persuaded to behave in the same way, photographers will rejoice, for they will then have cheap platinum.

The philanthropic gentlemen who recently advertised so largely that they would give away an enlarged photograph for nothing, and afterwards charged a fancy sum for framing it, were promptly sat upon by one or two energetic magistrates, and their little game was rendered hardly worth the candle. This framing dodge seems to have taken a fresh shape in the far-off region of Ohio, but if found to be successful, it is sure to find its way over here more quickly than some of us would consider desirable. In this case it is not the frame-maker who advertises, but the photographer, who promises to supply a dozen cabinets at the ordinary price, one of them being handsomely framed without extra charge. It seems curious that, while so many of the profession should be endeavouring to keep up the position of photography as one of the fine arts, others should do their best to bring it down to the level of the cheap grocery store, which gives away presents to the purchasers of each pound of tea or sugar.

Mr. F. H. Latimer, in a communication to *Engineering News*, states that the tediously long exposure necessary in the production of ferro-prussiate prints is immensely curtailed by the addition of oxalic acid to the sensitising solution. As a working formula, he gives the following: 1. Ammonio-citrate of iron, 120 grains; water, 1 fluid ounce; to which are added a few drops of strong ammonia solution till the odour is quite perceptible. 2. Potassium ferricyanide, 105 grains; water, 1 fluid ounce. 3. Saturated solution of oxalic acid. Equal quantities of the first two solutions are mixed together, and to 10 parts of this mixture from 1 to 3 parts of the oxalic acid solution are added just before use, with the result that in cloudy weather the solution containing 3 parts of oxalic acid prints about ten times as quickly as the pure solution. For ordinary purposes, however, it is better not to add more than 20 per cent. of the oxalic acid solution, or difficulty will be found in getting the lines to wash white.

Mr. Harrold Frederick, in his timely volume, "The Young Emperor William II. of Germany," writing of the Emperor's expression, says at times he has what may be called an "official countenance." It is this countenance with which the general public is chiefly familiar; for he assumes it in front of the photographer's camera, just as he does on parade, at formal gatherings, and even in his carriage when he drives through the streets. This suggests the question whether all Royal personages have their own particular photographic expression which is totally unlike that known to their familiar friends. So far as our own Queen is concerned, we could almost hope this was the case, as very rarely do her photographs represent her other than looking somewhat cross.

The Prince of Wales, on the other hand, is generally genial in aspect, and a comparison between himself as he appears at various functions, and his photographs, shows the latter to represent him fairly well. But of course he, too, may have an official countenance corresponding with his photographic one, so that after all this comparison does not count for very much. Passing from Royal to distinguished personages, it is certain we do not find that monotony in the photographs of the second which too often marks the photographs of the first. Take Mr. Gladstone, for instance; never does he appear the same in two photographs, and a similar difference is observable in the portraits which have been painted of him. We fancy there is something in the theory of the "official photographic countenance" of Royalty.

Over a year ago we gave an account of a singular book called "Giphantia," published in 1760, which anticipated in a curious way the discovery of photography. "Giphantia"—or "Giphantie," as the name is rendered in French, being an anagram on the name of the author, Tiphaigne de la Roche—has been re-discovered by A. de Rochas, who, in a recent number of *L'Intermediare des Chercheurs et des Curieux*, points out how, in "Giphantie," the experiments of M. Lippmann are forestalled. The parallel is certainly very close, and almost tempts one to enquire whether M. Lippmann was familiar with the dreamings of Tiphaigne de la Roche before he investigated the phenomena connected with his name. Those who are curious on the subject of "Giphantie" will find the book fully described in the Photographic News of April 4th, 1890.

Complaint has been made that the authorities at Stationers' Hall keep no index to the registers of pictures, engravings, and photographs, and the deficiency causes no end of trouble and confusion. Of what use is the register if access cannot be had to it readily? If it be intended as a protection against infringement of copyright, an obstacle is placed in the way of research which is wholly unnecessary.

## THE PHOTOGRAPHIC CONVENTION MEETING AT BATH.

Two years ago, when the Photographic Convention met at Birmingham, it was favoured with very much the same kind of aggravating weather which it experienced the first few days of the present week at Bath; aggravating because of its uncertainty, and its constant showers of rain, alternated with promises of sunshine which were never fulfilled. This, perhaps, did not so much matter on the opening day itself, for the business transacted was in the comfortable shelter of the Guildhall, and no photographic work was in contemplation. But when, after raining all night, Tuesday brought leaden skies and frequent downpours, it was a disappointment to the members who had arranged to visit Chepstow and Tintern, in accordance with the programme already published. First-rate photographs under such damp circumstances were of course impossible; but the weather did not prevent a goodly company assembling at the appointed time on Tuesday morning, *en route* for the valley of the Wye.

But to return to Monday's proceedings. The Convention met at the Guildhall at 6.30, when a formal reception took place under the auspices of the Mayor. The assembly was by no means as large as that at Chester last year, but paucity of numbers was compensated for in the presence of so many representative men. Influenza seems to have specially favoured photographers with its malignant attentions, for many here were heard comparing notes as to their experience of it, and more than one member bore evidence that the epidemic had attacked him.

During and after the reception, the members had an opportunity of inspecting the apparatus which had been sent for exhibition by various manufacturers and others. This exhibition, although smaller than might have been wished, contained some interesting items. Among the pictures were several of remarkable lightning flashes and cloud effects exhibited by the Royal Meteorological Society. The Platinotype Company showed some excellent pictures on wood, apparently intended as ornamental panels, the effect being very soft and beautiful. This Company also showed the key camera, with its effective and novel method of changing plates. Another form of camera shown was Turnbull's cyclists' hand-camera, made for both plates and films. Messrs. Watson and Sons had a representative collection of apparatus, and they also showed the convenient set of materials which they have recently introduced for the practice of the diazotype positive printing process. Each set, contained in a small case, comprises a bottle of primuline, sensitising materials, and developers giving differently coloured results. A convenient opportunity is thus afforded to all to practise a new and most interesting process. Messrs. Shew exhibited a very compact form of stereoscopic hand-camera, "The Eclipse," and Messrs. Newton showed a duplicate of the long range single lantern which they have recently constructed for the use of the Camera Club. Messrs. Ross showed many lenses, and also a well-designed camera of the detective form. A new process of enamel photography was illustrated by a fine example from Prof. C. C. Schirm, of Vienna. A number of lenses by Zeiss were exhibited by Messrs. Baker. Mr. Lancaster had a large space filled with his well-known goods; and lastly, Messrs. Taylor and Hobson, of Leicester, showed a goodly collection of lenses, among which we especially noticed their convenient casket arrangement by which several of different kinds fit one mount.

Mr. Austin King, as chairman of the local committee, introduced the members to the Mayor. He explained that the Convention was an association of gentlemen interested, whether as professionals or amateurs, in the art and science of photography, and it was their custom to meet every year in some district of which the surroundings were peculiarly congenial to the practice of their art. This year Bath had been selected, and he was quite sure that the gentlemen who had honoured them with that visit would return to their homes not only with many beautiful pictures of landscape and building, but also with very vivid recollections more permanent even than the best photographs of many pleasant scenes, pleasant people, and pleasant places. But the Photographic Convention did not base its claim to existence upon the practice of a delightful art amongst delightful surroundings. The members did much earnest work in furthering the interests of photography, in making it more practically useful, and by organising standards, and the equalisation of formulæ and nomenclature. They did much to render it possible for the workers in photography in one part of the world to avail themselves of the labours of other workers in other parts. For those reasons he thought that everybody now admitted that photography owed a very deep debt of gratitude to the Photographic Convention. To the Mayor, who was so well versed in art, and had been for so many years an ardent student of architecture, of archæology, and of literature, he need not develop the further point that, whereas photography owed a great deal to the Photographic Convention, they of the public owed a great deal more even than they were at all times willing to acknowledge to photography itself. It was true that photography did not invade those higher realms of art sanctified by the genius of painter and sculptor; but by its power of reproduction it enabled them to place the masterpieces of art, both ancient and modern, before the public in a way which would otherwise be impossible, and thus multiplied a thousandfold the use of those masterpieces as means of culture and education. But photography did far more than that in science; in every department—in zoology, in botany, in meteorology, and astronomy—photography is not only a useful servant, but an absolutely indispensable handmaiden. By means of photography the worker of one generation was able to begin his work at the point at which the previous worker had left off, because the work which had absorbed the labour of a lifetime was crystallised and made accurate for the use of posterity. For those reasons he asked them to welcome the Photographic Convention of the United Kingdom as gentlemen who, by visiting Bath, did it an honour, and he was quite certain that when they left Bath they would have nothing but pleasant recollections to take back with them.

The Mayor, in welcoming the Convention, said he was old enough to remember the introduction of photography into this country. He could call to mind the first dawning of their beautiful science. He could look back upon the wonder and pleasure which spread from town to town and from country to country when its beneficent power gradually became known. He had observed through half a century its wonderful progress all over the world, increasing incalculably human enjoyment, intellectual expansion, solid, practical, substantial good. Therefore, he could not fail to welcome most cordially those who were associated for its promotion. He could not hesitate, when a gentleman inquired of him whether they could have the use of that building, to say it would be quite at their service, and anything else they could offer. He did not know what the particular objects were for which they were associated; on that and other points they would doubtless enlighten and interest him. But he did know that when science, united with two such powers as the light of heaven and human skill (two of the most subtle and far-reaching powers in the universe), it was difficult to say what could not be done. He hoped that another power would favour them during their visit, he meant genial skies, for he thought they would see that the scenery of this district and the various architectural objects in Bath, Wells, Bristol, Salisbury, and Glastonbury, deserved any aid their art could give them to make their beauties better known. His Worship concluded as follows: We welcome you, then, as devoted to most interesting and important work, and we trust you will like our city and neighbourhood well enough to repeat your visit. There is a fountain in Rome of which it is said that those who taste of its waters always desire to come again; may your experience of this city of the springs be so pleasant as to give you the same desire.

Mr. Bothamley said, in coming to Bath, the Convention were visiting a place intimately associated with the early history of photography, with Fox Talbot, and Herschel, the latter being the first to apply photography to scientific purposes. Mr. Bothamley then relinquished the chair to the President-elect, of whose qualifications for the office he spoke in eulogistic terms.

Mr. Bedford, who mentioned that he was the first professional photographer to occupy the position of president, then delivered the following address.

## Presidential Address.

Five years have now elapsed since the first meeting of the Convention, and this, our sixth annual assembly, finds us in the city of Bath, built on the reputation of its healing waters, but of especial interest to us photographers as being in the neighbourhood of Lacock Abbey, the home of Henry Fox Talbot, and, undoubtedly, the first spot in the Kingdom ever depicted by the photographic camera.

Since our last meeting at Chester, it certainly cannot be said that the general interest taken in photography has in any degree abated; and, to assure ourselves of this, it is only necessary to point to the increasing number of societies and clubs which have sprung up all over the civilised world, to the spread of photographic literature and journalism, and, as a notable instance of the popularity of the art, to the successes claimed for the numerous exhibitions held at Liverpool, Vienna, and elsewhere.

Photographic societies generally have been showing marked activity. Although the scheme for the formation of a photographic institute brought forward by the Photographic Society of Great Britain has at present met with little more than moral support, and it is now clear that there is no immediate prospect of carrying it out in its entirety, the recent acquisition by the Society of premises of its own places it in a position to offer to other societies a scheme of affiliation which promises many advantages, and which can hardly fail to work, in all cases where co-operation is desirable, to the mutual advantage of all, without in any way interfering with individual action.

The new premises of the Camera Club are a monument to the energy and enterprise of its management, and the annually recurring conference of that body, as well as its periodical "one-man" exhibitions, reminds us, as in past years, of the good work it is doing.

The Photo-Survey Council of Warwickshire—a body constituted out of the photographic societies of Birmingham and Warwickshire—is doing excellent work, and challenges friendly rivalry with other counties. It embraces archæology, ethnology, geology, and botany, in addition to the ordinary work of recording the general appearance of the county at the present day.

In speaking of advance in the science of photography, it is difficult to gauge the importance of discoveries which require time to develop their capabilities, and I shall very possibly pass over without notice germs of discoveries more important than those I shall mention. There can, however, be no doubt that, in the province of systematic or specialised investigation, Messrs. Hurter and Driffield, by the further prosecution of their researches into the effect of development on the ratio densities of negatives, and other photographic scientists in critically following them, have been doing most valuable work; and, when it is remembered that these investigations are only a first step towards the establishment of an absolute standard of sensitiveness, it is easy to appreciate the importance of the elimination of all errors of observation and measurement from their calculations.

Perhaps the announcement of most interest to the photographic world has been that of M. Lippmann's discovery of a means of representing by pure photography, and subsequently fixing, the colours of the spectrum. Possibly no discovery is ever announced in the present day without resorting to a long stretch of unscientific imagination, and this has certainly not been absent here; but it seems that M. Lippmann's experiments have been guided by a theory propounded in 1887 by Lord Rayleigh, that the colours of Becquerel's reproductions of the spectrum were possibly due to the action of stationary luminous waves, producing, in a nearly transparent sensitive film, a laminated structure which would copiously reflect the particular kinds of light which had produced them. The essentials, according to M. Lippmann, are the continuity or absence of granularity of the film, and the presence, during exposure, of a reflecting surface behind this film. Spectrum red, yellow, green, and blue have thus, it is said, been vividly reproduced and fixed; but the process is not applicable, so far as can be foreseen, to the reproduction of impure or mixed colours. There seems to be plenty of scope for experiment in this direction, and, it may be added, plenty of scepticism as to the results obtained.

A practical method of producing a direct positive from nature, or a reversed negative direct from another negative, has long been a desideratum, so that unusual importance attaches to the discovery, by Colonel Waterhouse, that the addition of a minute quantity of thio-carbamide or of thio-sinamine to the eikonogen developer has the effect, in favourable conditions, of effecting during development a complete reversal of the photographic image, and this with exposures one-tenth the duration of the normal. The substance he finds to answer the purpose best is Dr. J. Emerson Reynolds' preparation of thio-carbamide with ammonium bromide, which is a combination of four molecules of the former substance with one of the latter. Additional interest attaches to this process by the further observation of Colonel Waterhouse that development is accompanied by electro-chemical action, in which the current passes in the reverse direction to that observed in the ordinary course of development.

In the domain of photographic optics the outlook is encouraging. We have specifications from Dr. Ernst Abbé and Dr. Paul Rudolph of an apochromatic objective composed of two uncemented single lenses and a compound correcting lens of considerable focus; also three forms of unsymmetrical doublets, each possessing special characteristics of its own. The construction of these lenses, which has now been rendered possible for the first time by the introduction of the new kinds of optical glass, has been carried out by Zeiss, of Jena, and they have been favourably reported upon by Dr. Stolze and by Dr. Eder, but they have not at present been introduced commercially.

The primuline printing process of Messrs. Green, Cross, and Bevan, which was brought before the British Association at Leeds, has attracted much attention, and has found useful application in printing on textile fabrics as well as in copying drawings and plans. It is based on the fact that diazotised primuline is decomposed by light, and can then be developed by a phenol or an amine, producing coloured designs on a yellow ground. In Feer's diazo printing process, which preceded the primuline process, similar colours are produced on a pure white ground, without development. The former method requires a reversed positive, the latter an ordinary negative to print from. Both these processes are of special interest, marking as they do a new departure in photographic printing.

Mr. M. Carey Lea, further pursuing his experiments with allotropic silver, has produced a well-defined form between it and ordinary silver, of a bright yellow-gold colour, and describes the effect of different forms of energy upon it, producing varieties of colours not hitherto obtained.

When we look back on the photo-scientific achievements of the past twelve months, I think we must all agree that there has been no lack of progress to record; but it is a question of, perhaps, still more moment to inquire what advance has been made in the artistic direction. With the numerous exhibitions now held, we have, in spite of the unnecessary restrictions imposed, ample means of forming an opinion of the use we are making of the tools which science places at our disposal. At our last meeting, it was deplored that a new school had arisen among photographers, a school whose teaching implies "that art is not to be found in the ruts of tradition, and that beauty is not to be sought in a far country," and was asking if photography, which, by its mere existence, had already done more than anything else to inculcate truth in art, was not itself in dire need of reform; and further, if it was not possible to picture by legitimate means a loftier conception of nature than was attainable by a mere transcript. These are the principles it was thought dangerous to spread; and, pointing to the crude attempts of its disciples to depict their impressions of nature, some went even so far as to suggest that photography was so far counterfeiting other methods of illustration, that it was running imminent risk of survival only by mimicry! This revolutionary school, however, still lives, and not only so, but is reaping due recognition of its merits, though not unmixed with wholesome criticism of its shortcomings, and, in spite of the fact that its former master, by his great act of renunciation, has left it to its own devices. After all, are we to conclude that its work is inimical to progress? Is it all to end in unilluminated dreariness? We are, at least, at liberty to exercise our right of judgment, though it is humiliating to be told that a picture one had admired on the walls of an exhibition has been singled out for distinction as an example of an evanescent printing process, and that another has been similarly honoured partly for the reason that it was taken without a lens. But we must not be too hard on our judges; we voluntarily submit our work, and must abide by the verdict and the reasons which prompt it, though one could wish that rules might be adopted for exhibitions which would tend more to the glory of photography and less to that of the individual photographer and the process he employs. It is, nevertheless, true that science and art react mutually on one another, and are interdependent; consequently, the photographer who is a true artist can as little afford to despise the aids of science as science can afford to ignore the requirements of art. The demand is made for the more accurate rendering of tone and colour, so that we may no longer be shocked by the palpable resort to expedients which constantly meets us in photographs which would be admirable as pictures if it were not for the suspicion of unreality such practices engender. Moreover, let us not imagine that there is any danger of our art being made too easy. Even if automatic photography be an accomplished fact, some measure of responsibility will still rest with the individual who drops in the coin. Though "art is a translation of nature," it must always be remembered that "we make from within us the world which we see" and transcribe. It is true our translations of nature may be cold glitter beside the reality, but photography is our pencil, and if we use her fairly she will not fail us.

It fell to the lot of Mr. Pumphrey, president of the local photographic society, to return thanks to Mr. Bedford for his excellent address. Mr. Pumphrey, in the course of a few happily chosen words, pointed out how photography ought to win the attention of all municipal bodies, because of its help in preserving for us and posterity the images of many things which, in the course of time, were passing away from us. He referred not only to buildings, but to new cuttings on railways where geological sections were exposed. These, he considered, should be photographed in their original freshness, and before their characteristic features were altered by the action of the weather.

Mr. Pringle, in proposing a vote of thanks to the retiring president, Mr. C. H. Bothamley, referred to his untiring energy, his simplicity of speech, and his scientific accuracy, which, he considered, amounted to a marvel. He informed the meeting that the county of Somerset had lately had the good fortune to acquire Mr. Bothamley's services as organising secretary under the Education Act, "and certainly," he said, "no one is better fitted to fill such a responsible post." After a reply from Mr. Bothamley, and a vote of thanks to the Mayor for the kind manner in which he had received the Convention, the formal proceedings terminated.

After a brief interval, a number of lantern slides were shown, from negatives taken by various members during last year's meeting, Mr. Pringle being at the lantern, and Mr. Bothamley acting as a very competent showman.

### Annual Meeting.

The annual meeting of the members of the Convention was held at the Guildhall on Wednesday morning, Mr. W. Bedford, president, in the chair. After business of a routine character, a discussion took place for the purpose of deciding where the Convention should hold its meeting of 1892. Official invitations were received from the Edinburgh Photographic Society and the Devon and Cornwall Camera Club, the latter invitation being to Plymouth, and held good for the summer of 1893 in the event of the place of meeting for 1892 having been decided upon. On the motion of Mr. A. Pringle, it was unanimously decided to accept the Scotch invitation. It was further resolved to write officially to Plymouth and thank the Devon and Cornwall Camera Club for their invitation, and hold out a probable prospect of acceptance for 1893.

The president acknowledged the cordial welcome extended to the Convention by the Mayor of Bath, and votes of thanks were accorded to his worship for the same, to the leaders who had conducted and would conduct excursions, to the gentlemen who had lent dark rooms, and those who had given permission to photograph, to those who had exhibited photographs and novelties, and also to the hon. secretary, Mr. Briginshaw, for his untiring labours on behalf of the Convention.

A scheme of affiliation by which it was proposed to more closely unite the Photographic Societies of the United Kingdom for the better promotion and advancement of their common interests, and pointing out the objects to be attained thereby, was presented for consideration from the Photographic Society of Great Britain. Mr. C. H. Bothamley observed that the matter was a great deal too important to be decided upon off-hand, and proposed that it be referred to the Council. Eventually it was agreed to adjourn discussion of the subject to a meeting on Saturday.

Subsequently, a meeting of the general committee was held, and at noon Mr. Middleton Ashman took photographs of the Convention group in the Sydney Gardens.

---

Photography for Women has been recommended so often and so earnestly as a business that, now that some few are taking it up as a serious occupation, it is interesting to note the special differentiation of the pursuit which attracts the sex that wears and loves gowns. There are a few portrait photographers among women who meet with only moderate success, curiously enough, in posing their subjects, but find a field of usefulness in the picturing of children. There are springing up also dress photographers, whose business, though a new one, appeals so strongly to certain feminine instincts, that the seeds of success seem likely to sprout and thrive. One of the two or three already established was saying: "So far my work has been mostly the reproduction of trousseaus. Brides come to me to be pictured in all their different wraps and hats and gowns. For a girl whose wedding came off last week, I made twenty-six costume pictures. She had them bound into a wedding album. Of course it takes ingenuity to get variety of attitude and to bring out the best points of each toilet. I think women prefer to go to women on such an errand, because they think a man, down in the bottom of his heart, might conceal a smile."—*New York Recorder.*

## A NEW EMULSION FOR PRINTING-OUT PAPER.

BY PROFESSOR W. K. BURTON.

I remember once talking to Mr. W. B. Bolton, to whom we owe so much for our present knowledge of emulsion work, on the genesis of collodio-bromide emulsions. He told me that one of the suggestions came from Rejlander. This artist was always in trouble with his bath, or his collodion, or both, and, speaking with Mr. Bolton and some other experimentalists, he asked, "Cannot some of you clever fellows get over this eternal bother by mixing the whole lot up together?" Well, a collodion emulsion may be looked on as a mixture of the collodion and the wet plate bath. The water is the only thing that is left out, and not the whole of that.

Something of the same thing suggested itself to me some time ago in connection with printing. I had been trying various different ways of sensitising plain paper with silver salts, trying, amongst others, some of the excellent processes of Mr. Lyonel Clark, and I got good results with many of them, if I gave the necessary amount of care and took trouble enough; but the care needed was certainly great, and the trouble of the double process of salting and sensitising more than I liked. Moreover, I found that I was very liable to get defects in the way of spots, streaks, and the like, even after all the care and trouble. Why not, I thought, get over at least half the trouble by mixing the ingredients up together and applying them to the paper in one operation? Every formula that I had been using contained gelatine as one of the constituents, and had the making of an emulsion in it.

There is nothing new in this, it may be said. It is nothing more nor less than the gelatino-chloride emulsion that we are already acquainted with under various names, such as "aristotype," and goodness knows what else. I think, however, that the emulsions that I am going to describe have several novel features. In the first place, they are emulsions that need no washing, and that are made by the extremely simple process of pouring one liquid into, or mixing one liquid with another. The emulsions are, moreover, ready for use at once, and, being liquid at ordinary temperatures, can be applied to paper or other materials either by floating, as in the common method of sensitising albumenised paper, or by brushing them over the material that it is wished to sensitise. Farther than this, no gloss is given to the surface of the paper. I think, indeed, that by this process the preparation of sensitised paper—of any kind so far as surface is concerned—is reduced to the utmost possible simplicity.

I have tried a number of variations in the quantities of chemicals, and have had more or less success with all. In fact, there is great elasticity in the proportions that may be used, and I believe that almost any formula for a printing-out gelatino-chloride emulsion might be taken, and that good results could be got if one or two considerations were not lost sight of. The first is that the quantity of gelatine must be kept so low that it will not cause a gloss on the paper, or cause the emulsion to set at ordinary temperatures. The second is that the formula must insure a large quantity of insoluble silver salt in suspension. The reason for this is that the coating got by an emulsion that does not gelatinise immediately after coating is much thinner than if it does gelatinise.

To those who have not had much experience in emulsion work, it may be worthy of remark that, within very wide limits, the same quantity of an insoluble silver salt is emulsifiable in a given quantity of water, whether the quantity of gelatine used as a menstruum be great or small. Roughly speaking, the haloids, or I imagine the other insoluble or nearly insoluble salts of silver, resulting from the decomposition of one ounce of silver nitrate, can be emulsified in ten ounces of water, but if that quantity of silver be exceeded a part will not emulsify, but will be thrown down in the granular form, in which it is useless for sensitising any surface. The proportions vary, however, with certain conditions—such as alkalinity or acidity of the solutions.

The difference between the failure of a silver haloid to emulsify in a gelatinous solution, and the precipitation of it from that solution afterwards, must not be lost sight of. Thus, if any of the emulsions that I am now writing of be kept for a number of days at a highish temperature—such as that of pretty hot weather—it is likely that a good deal of the insoluble silver salt will be found at the bottom of the vessel holding the emulsion, but this silver salt is not in the granular state, and can be re-emulsified by heating the mixture to about 120° Fahr., and shaking well, the more easily if a little more gelatine be added.

I select three formulæ as follows:—

*Formula* No. 1.

| | | |
|---|---|---|
| A.—Nitrate of silver ... | ... 400 | grains |
| Water ... | 4 | ounces |
| B.—Gelatine (soft) ... | ... 80 | grains |
| Chloride of ammonium ... | ... 80 | ,, |
| Citric acid ... | ... 120 | ,, |
| Water ... | 8 | ounces |

*Formula* No. 2.

| | | |
|---|---|---|
| A.—Nitrate of silver ... | ... 400 | grains |
| Water ... | 4 | ounces |
| B.—Gelatine (soft) ... | ... 80 | grains |
| Chloride of ammonium ... | ... 80 | ,, |
| Citric acid ... | ... 120 | ,, |
| Carbonate of soda (dry) ... | ... 45 | ,, |
| Water ... | 8 | ounces |

*Formula* No. 3.

| | | |
|---|---|---|
| A.—Nitrate of silver ... | ... 400 | grains |
| Water ... | 4 | ounces |
| B.—Gelatine (soft) ... | ... 80 | grains |
| Chloride of ammonium ... | ... 80 | ,, |
| Citric acid ... | ... 60 | ,, |
| Carbonate of soda (dry) ... | ... 80 | ,, |
| Water ... | 8 | ounces |

In my hands the first formula gives an emulsion suitable for preparing paper to be used for printing from dense negatives, the second from medium negatives, and the third from thin negatives.

The third formula is, I am afraid, dreadfully unorthodox. Unless I have made a mistake in my chemistry—which is highly probable—there is just about enough of ammonium chloride and of sodium citrate formed by the double decomposition of the citric acid and of part of the soda to decompose the whole of the nitrate of silver. I don't know whether, in this case, there will be carbonate of silver formed; but if not there remains a large excess of carbonate of soda. All I can say is that the formula works all right, and that the paper that results from the use of it keeps very fairly. The paper resulting from either of the other formulæ will, I have no doubt, keep as long as any ready sensitised paper. I have already kept some nearly a month, and it is still quite white.

The following is the method of emulsifying. The two solutions are heated to a temperature of 110° to 120° Fahr. The temperature should not be greater than 120°, or there is a great chance that some of the insoluble silver salts produced will be thrown down in the granular form. A is then added slowly to B with much stirring. The emulsion is filtered through a double thickness of cambric, and is then immediately ready for use. If it is wished to keep the emulsion for any length of time, 10 per cent. of alcohol, in each ounce of which a few grains of thymol have been dissolved, should be added to the emulsion. It is to be observed, however, that, even with this addition, emulsion by formula No. 3 will not keep for very long.

The best way of coating is certainly by floating, allowing three or four minutes, but the quantity of emulsion needed is considerable. It is possible to get an even coating by brushing with cotton-wool in the following way. The paper is laid on a sheet of glass, or a clean board, and is thoroughly and evenly damped with the solution by brushing over the surface several times in directions at right-angles. It is put on one side for ten minutes or a quarter of an hour to get surface-dry, when the operation is repeated. By working in this way, it is possible to do with a very small quantity of solution emulsion, and it is possible to use what there is to the last drop, but the quantity used will be found to be more per sheet than in the case of floating. The reason, I imagine, is, that it is impossible to get an absolutely even coating by brushing, and that it is, therefore, necessary to make the coating so thick that there will be sufficient silver where it is at its thinnest. I have never been able to get an even enough coating by brushing only once.

The temperature of the operating-room should be not below about 70° Fahr., or else the emulsion should be warmed.

The paper is best dried pretty quickly before a fire, or near a stove, after it has lain face upwards for about four or five minutes to get partly surface-dry. In fact, the paper is best treated, in the matter of drying, like paper that has been coated with the solutions for the "hot bath" platinotype process.

It will be found that it is possible to coat about eight sheets of "medium" sized paper (22 by 17, the orthodox photographic size) with the quantity of emulsion given above by brushing, or ten to twelve sheets with a consumption of the like quantity by floating. It will thus be seen that the process is an economical one.

The colour in the printing frames should be a rich brown with either of the first two formulæ, a deep purple with the third.

The printing is very quick, whichever of the formulæ be used, but with No. 3 it is extraordinarily so. Indeed, paper coated with emulsion prepared by this formula is, I think, more sensitive than that by any other printing-out process that I know of. It is so sensitive that it is quite necessary to take extra precautions in working it. It needs at least all the care that platinotype paper needs, although there is, of course, the difference that, in the case of the silver paper, the result of the action of feeble light is seen at once; in the case of the platinotype paper it is not seen till the time of development. I consider it best to do everything in the way of preparation by gas or lamplight.

Toning may be either by gold or platinum. I prefer Clark's platinum process to any other. I add, however, a good dose of salt to the solution, and put the prints into it dry; that is, at least, when using either of the first two formulæ. When using the third, the prints are washed in a weak solution of citric acid before they go to the toning bath to neutralise the alkalinity.

If a platinotype toning bath that has been used for some time, and that has been repeatedly strengthened with chloro-platinite of potassium, be used, a colour is got that some people dignify with the appellation "sepia tint," but I incline to call it a dirty brown.

I find that the emulsion is readily applicable to wood, and I hope to get good results when I have had some panels made of one or other of the beautiful white woods, with a fibre-like silk, that are peculiar to this country. I have got very fine colours of image by printing lightly and intensifying, as suggested some time ago by Clark, but have not as yet been able to overcome a tendency to staining in the whites. Perhaps Mr. Clark will help me with a hint or two in connection with this matter.

I send a few samples of prints done by the process, but I do not think they are fair examples of what it is capable of. They are all merely some of the results of my experiments, and are on Whatman's drawing-paper, which is not very suitable for photographic purposes unless it is specially sized, and I have not sized it. It is the only pure matt-surface paper at present procurable in this country. The prints on it look tolerable only from some little distance. I hope to have some more creditable results ready later on. There are some words of explanation in pencil on the back of each print.—*Paper read at the Camera Club.*

## RETOUCHING AND SPOTTING PHOTOGRAPHS.

After printing and toning, photographs are often found to have white spots, and the mediums employed to cover them are often removed in the enamelling and burnishing processes. Mr. Beacham, of Litchfield Street, Soho, W.C., has patented a crayon for spotting and retouching, which is made as follows: White wax, 32 parts; curd, yellow, or Castile soap, 27 parts; mutton suet, 4 parts; salts of nitre, 1 part, dissolved in eight times its weight of water; pitch, 4 parts; shellac, 6 parts; calcined lamp-black, 4 parts; dyes or stains in powder—brown $7\frac{1}{4}$ parts, scarlet $3\frac{1}{2}$ parts, blue 3 parts, violet $3\frac{1}{2}$ parts. These colours produce a useful photo-shade, but the proportions can be varied according to the shade required; other colours can also be produced if required. As soap contains more or less moisture, according to age, it must be cut into small pieces and dried before using. The suet and wax are first melted; the soap, having previously been cut into small pieces, is then added a small piece at a time, allowing each piece to dissolve before another is added. When dissolved, they are allowed to burn until reduced to the same volume as before the soap was added. Care must be taken not to allow them to burn too much or too quickly (it may be necessary to take the vessel off the fire to prevent the contents from boiling over). The flame is then put out. When these three ingredients are dissolved, and the salts of nitre has been mixed with eight times its weight of water and warmed, it is added by small quantities to prevent too much effervescence. The shellac and pitch are added. The requisite colours, in powder dyes or stains and calcined lampblack, are mixed with a stiff varnish or suchlike suitable substance. It is essential for the whole to be dissolved into one substance, and kept stirring during the whole of the foregoing process with an iron spatula or palette knife. When a little cool, it is poured out on a marble slab previously rubbed with soap or suet. When set a little, it is cut into small pieces and re-melted—re-melting is done to give a finer texture to the ingredients—then moulded into suitable form and pointed, finally finishing off the point by rubbing on paper; fine glass paper or emery cloth may be used. In spotting a photograph according to the invention, the point of the crayon may be moistened by dipping it in clean water, and if the spots are very obstinate to cover, acetic acid or carbolic acid must be added to the water, about three parts acid to one part water. The acid must always be added to the water when photographs are to be enamelled, and when the film is thin on the negative in spots; if the photographs are spotted in quick succession after mounting, there will be found sufficient moisture to dispense with the use of water, unless the spots are difficult to cover, when the acid, or acid and water, must be used. If photographs are spotted after burnishing, and show dull spots when spotted, a slight rub with a piece of clean rag or chamois leather dipped in French chalk will be sufficient to remove the dullness. The degrees of hardness may be obtained in two ways—first, by increasing the salts of nitre; secondly, by cooking longer. It is better to obtain the degrees of hardness by cooking, as much salts of nitre will make the crayon too brittle. Copal varnish may also be used to mix the colour when required harder. Only two colours are necessary in manufacturing the retouching crayon—viz., brown and black, nine parts of each, added to the ingredients before mentioned, leaving out the other colours. The crayon can be used on the negative film without the retouching medium, or can be used on the retouching medium without the negative varnish. Should the retoucher accidentally stipple too heavily, the spots can be reduced to the shade required by the point of a brass pin, not too sharp, or can be removed by rubbing with a piece of pointed ink-eraser, or piece of chamois leather over the finger, without removing the varnish or retouching medium in the usual way with methylated spirit.—*English Mechanic.*

## Patent Intelligence.

### Applications for Letters Patent.

11,107. Christian Johan Schuyer, 186, Fleet Street, London, "Improvements in or pertaining to Optical Lanterns."—June 30th.

11,150. Fox Shew, 20, High Holborn, London, "Improvements relating to Photographic Shutters."—June 30th.

11,191. John Boultbee Brooks, 115, Great Charles Street, Birmingham, "Improvements in Photographic Cameras, and in Stands for same."—July 1st.

11,207. Charles Henry, 21, Southampton Buildings, London, "Manufacture of Phosphorescent Sulphide of Zinc, and the Application thereof to Vehicles or Substances used for Washing, Dyeing, Painting, and Printing."—July 1st.

11,283. John William Beaufort, 25, Colmore Row, Birmingham, "Photographic Reliefs in Rubber, or similar Substances for Hand-Stamping with Ink."—July 3rd.

11,351. William Summers Parkinson, 30, East Parade, Leeds, "Improvements in the Construction of Photographic Shutters."—July 4th.

11,355. Alexander Thomas Hall, 12, Cherry Street, Liverpool, "Improvements in or connected with Photographic Dark Slides."—July 4th.

11,372. George Mason and Alexander L. Henderson, 87, St. Vincent Street, Glasgow, "Improvements in Supports for Photographic Cameras."—July 4th.

11,394. Fox Shew, 23, Southampton Buildings, London, "Improvements in Photographic Hand Cameras."—July 4th.

## Correspondence.

### PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Sir,—The exhibition committee of the Photographic Society of Great Britain desire me to inform you that the annual exhibition of that Society will be held at the Gallery of the Royal Society of Painters in Water Colours, 5a, Pall Mall East, from Monday, the 28th of September, until Thursday, the 12th of November next.

The exhibition will be open daily (Sundays excepted) from 10 a.m., to 5 p.m., and on Monday, Wednesday, Thursday, and Saturday evenings from 7 to 10 p.m.

The following gentlemen have been appointed judges, and have consented to act: Messrs. J. E. Austin, F. Hollyer, P. H. Newman, F. M. Sutcliffe, and J. B. B. Wellington.

Medals will be placed at their disposal for artistic, scientific, and technical excellence of photographs, for lantern transparencies, and for apparatus.

Negatives and transparencies, photo-mechanical prints, photographs of purely scientific interest, photographs coloured by scientific or mechanical means, and apparatus and appliances containing points of special interest, will be admitted, but photographs coloured by hand will not be admitted.

Photographic lantern slides will be shown on the evenings the exhibition is open by means of the Society's optical lantern. The exhibition committee will be glad to receive slides for exhibition, especially such as are illustrative of life and scenery in the British Colonies and Possessions. No charge will be made for exhibiting such slides, which should be delivered at the offices of the Society early in September in order to enable the committee to group and arrange them. Slides, however, will not be eligible for a medal unless the conditions in the prospectus be observed.

Blank entry forms and any further information respecting the exhibition, apparatus, and lantern slides can be obtained on application to the Assistant Secretary, P. S. G. B., 50, Great Russell Street, London, W.C.

H. S. Lawrance, Assistant Sec.

*Photographic Society of Great Britain, 50, Great Russell Street, W.C., July 3rd.*

Mounting Photographs.—The following is a receipt forwarded to *Discovery* by Mr G. E. Thompson, of Liverpool. If large photographs are mounted damp and with starch, the expansion and contraction are so great that the mount is cockled. The correct principle is to mount the print as dry as possible. First, have the prints in a pile, nicely damp and flat. Glue with fine, clear Russian glue and a flat hog's-hair brush, and spread each print out face down to dry. When dried they may be trimmed, and kept any time until required for mounting. To mount, have about twelve half-sheets of thick blotting-paper. Place two dry sheets at the bottom, then one well-damped sheet next; lay, say, twelve photographs on this sheet in a pile, and place another damp sheet on the pile. Have one more damp sheet, and then the rest of the dry sheets. Now take out the top photograph and place it between the two top damp sheets. This is merely to take the hardness out, and the print must not remain long enough to allow expansion. Take it out (putting the top one of the pile in its place) and place it on the top dry sheet. Now sponge it all over with a fine sponge from the middle to the ends, taking care to wet it all over; it must be merely damped, and with as little use of water as possible. Take it up and lay deftly in its place on the mount, smoothing it out from the centre of the print; now take a sheet of paper and a handkerchief and rub it down from the centre to the edges. It is better to have a flat burnisher at hand to smooth any unevenness. If the print has been nicely mounted and with no unnecessary damping, it will soon dry, and, even if only in a paper book, the cockling will not be much. The glueing must be thin and even—something of the nature of the gum on a postage stamp. The sheets of blotting-paper will require redamping if a number of photographs pass through, and it is not well to wet too many on the top sheet without changing it, as the paper is apt to fray up, and small pieces will then stick to the glue and make the finished picture uneven.

# Proceedings of Societies.

Amateur Photographic Association.

A council meeting for the award of prizes was held July 1st, at 58, Pall Mall, S.W., the Right Hon. the Earl of Rosse in the chair.

The secretary, Mr. A. J. Melhuish, laid before the council the pictures for the current year. They had been classified by Mr. Glaisher into classes 1, 2, 3, 4, and 5, and the classification, subject to two alterations, was approved by the council.

Class 1 coutains 139 pictures, contributed as follows :—C. Stephens 3, General Kaye 4, R. Murray 10, F. S. Schwabe 3, Major Board 1, R. O. Milne 9, R. Leventhorpe 7, W. Gaddum 8, Miss J. Wilson 2, Mrs. R. Benson 2, Dr. Drew 4, Surgeon-Major Foster 7, F. G. Smart 10, the Vicomte de Condeixa 6, H. O. Hutchiusou 11, F. Wrigley 4, Miss Mahou 8, Arthur R. Dresser 17, H. Emmons 3, F. Griffith 8, W. Dumergne 8, aud M. de Dóchy 4.

The pictures were considered by the council to be the best ever contributed to the Society. Some by Mr. Dresser were pronounced to be altogether a step in advauce. The interiors at Fontainbleau, by the Vicomte de Condeixa, were also greatly admired. A sunset picture by Mr. Smart was considered quite a work of art. There are also some fine tree studies by Mr. Milne.

The following prizes were awarded : To Mr. Arthur R. Dresser, the first prize, a large silver goblet ; to the Vicomte de Condeixa, the second prize, a silver goblet ; to Mr. F. G. Smart, a silver goblet ; to Mr. R. O. Milne, a large album, handsomely bound ; to Mr. R. Leventhorpe, a handsome portrait album ; to Mr. H. O. Hutchinson, au oil painting in frame by McEvoy ; to Mr. W. Gaddum, a picture in frame ; to Surgeon-Major Foster, a large silver medal ; to Miss Mahon, a handsome portrait album ; to Mr. F. Griffith, a medal ; to Mr. R. Murray, a handsome portrait album ; to Dr. Drew, a handsome portrait album ; and to Mr. W. Dumergne, a medal.

The following members had been previously elected : Messrs. A. Craigie, E. F. Sandeman, Arthur R. Dresser, Francis Gosset (Deputy Sergeant-at-Arms), and Hamilton Emmous.

Putney Amateur Photographic Society.

*July 3rd.*—Mr. W. H. Congreve in the chair.

Prints were showu from negatives of the Buruham Beeches excursion, which was fairly well attended.

Twelve entries were announced for the summer competition, a series of four priuts.

A discussion on slide-making, following the reading of a paper on the subject, theu took place.

Richmond Camera Club.

An outing was arranged to Brentford and Isleworth ou June 27th. Four members only appeared, and the wind was too high to allow of many exposures being made.

The ordinary meeting was held on July 3rd, Mr. Irvine in the chair. The subject for discussion was "Shutters," and a Kershaw, a Thornton-Pickard, and an Automatique were shown and explained.

Glenalmond Photographic Club.

*July 4th.*—The President in the chair.

After the transaction of routine business, a "hat night" took place, in which twelve members took part, speaking on various subjects. There was a large show of photographs, &c. Some opals and aristotype prints were shown by Messrs. Maxwell, and some bromides by Messrs. De Putron and Johnstone, after examination of which the meeting adjourned.

Halifax Camera Club.

*June 29th.*—The report of the provisional committee was adopted, and it was resolved to take for the Club the premises recently occupied by Mr. Gregson as a studio, where the next meeting, arranged for the 6th instant, will be held.

The following officers were elected :—*President*—E. J. Smith ; *Vice-President*—Thos. Illingworth ; *Hon. Treasurer*—J. I. Learoyd ; *Hon. Secretary*—Edgar Booth ; *Committee*—W. Wainhouse, Dr. Leech, E. Finlinson, E. J. Walker, W. H. Ostler.

The formal opening of the Club has been fixed for Tuesday evening, the 4th August.

The number of members has already reached the satisfactory total of 58.

Photographic Society of Japan.

The annual meeting was held at the rooms of the Geographical Society of Japan, Nishikonya-cho, Tokyo, on May 29th.

Mr. Ishikawa having announced that he had received a uote from Viscouut Okabe, vice-president of the Society, who had been asked to preside, to the effect that he would not be able to attend, Mr. Edmond R. Holmes took the chair.

The following report of the secretaries, for the past year, was read :—

Like the last year's report, the preseut one need be but short, as there is little to record save the successful working of the Society for another year. The membership of the Society now exceeds a hundred. Siuce the last annual meetiug there have been only four ordinary meetings, but there have also been two exhibitious of photographs. One was held in Tokyo in the autumn of last year, the exhibits consistiug of the photographs done by members during the vacation. The other was held in Yokohama quite recently, the object being the exhibition of the results of work done ou bromide paper that had been presented to the Society by Mr. S. Cocking, and also to award prizes kindly offered by Mr. Cocking to the exhibitors of the three best pictures. Both exhibitions were highly successful. Besides these there were several outdoor meetings that afforded great pleasure to those who atteuded. It is to be regretted that the atteudance at out-door meetings is not larger. The following processes have beeu described or demonstrated at different times since we presented you with last year's report :—The development of bromide priuts, Husband's photolithographic process, the carbou process, the gelatino-chloride printing process, the renovatiug of spoiled eikouogen, flash-light photography, and a new silver printiug process. As regards the number of membership, attendance of meetiugs, aud work doue, we venture to pronounce the Society a success, but we still have to regret that the Society does not receive more support than it does from the profession generally.

The balance sheet read by the treasurer indicated a decided advance in the prosperity of the Society.

The electiou of officers for the ensuing year was then proceeded with. With the exception of Dr. W. S. Bigelow, vice-presideut, who has left the country, aud Mr. J. Johnstone, member of committee, who resigned some time ago ou account of his not having time to attend to the work of the Society, all the officers of last year were unanimously re-elected. Mr. J. B. Rentiers and Mr. I. Ishikawa were elected members of committee, and Mr. C. D. West was elected a vice-president.

A large number of samples of their manufactures that had been presented to the Society by the Fry Manufacturing Co., of Londou, were distributed amongst the members present. Some excellent work in the way of bromide prints and opals, done on certain of the samples by Mr. S. Kajima, were also shown.

Mr. C. D. West had tried the plates, and had fouud them of very high quality.

Mr. W. K. Burton showed some platinotype prints. These, he explained, had been done on paper that had beeu kept for more than a year, and that gave nothing but deep fog worked in the usual way. Excellent results had, however, been got by printiug very deeply, then developing with a cold solution made up as follows :—A five per cent. solution of washing soda, 20 ounces ; a saturated solution of bromine in water, 50 minims. He did not remember who had first suggested the use of soda as a developer for platinotype prints. The bromine had been suggested by Dr. E. Divers, F.R.S. It formed hypobromite of sodium with the soda solution, and this was a powerful restrainer of fog in platinotype work.

Mr. K. Arito showed some prints on drawiug paper that were of a remarkably fine black tone. They had been prepared by the following formulæ:—

*Salting Solution.*

| | |
|---|---|
| Chloride of ammonium ... ... ... | 50 grains |
| Gelatine ... ... ... ... ... | 100 ,, |
| Water ... ... ... ... ... | 10 ounces |

This was warmed, and 2 ounces of negative varnish were added.

*Sensitising Solution.*

| | |
|---|---|
| Nitrate of silver ... ... ... ... | 2 ounces |
| Water ... ... ... ... ... | 10 ,, |

*Toning Solution.*

| | |
|---|---|
| Chloroplatinite of potassium ... ... | 15 grains |
| Citric acid ... ... ... ... | 50 ,, |
| Water ... ... ... ... ... | 25 ounces |

*Fixing Solution.*

| | |
|---|---|
| Hyposulphite of soda ... ... ... | 2 ounces |
| Water ... ... ... ... ... | 10 ,, |

After the meeting there was a *conversazione*.

Experiments with Selenium Cells.—Selenium cells made in the manner suggested (*Nature*, 23, 58) gradually lose their great resistance and also their sensibility to light. Only one cell out of thirteen retained its original sensitiveness over a space of ten years. A current from a 26-volt battery, passed through a selenium cell with copper electrodes for two days, deposited amorphous selenium and an oxide of selenium at the anode. The resistance of the cell was then different, according as the current passed from anode to cathode or from cathode to anode. When a piece of magnesium ribbon was burnt near this cell, a current from anode to cathode was indicated by the galvanometer, which ceased when the light was extinguished. The current was proved not to be due to thermo-electric action.—*Phil. Mag.*

Royal Institution of Great Britain.—At the general monthly meeting on Monday, July 6th, Sir James Crichton Browne in the chair, Messrs. Henry Claudius Ash, Henry T. C. Knox, and John George Mair-Rumley were elected members of the Royal Institution. The special thanks of the members were returned to Miss Jane Barnard, Dr. J. H. Gladstone, the Rev. A. R. Abbott, Mr. T. F. Deacon, Mr. A. Blaikley, and others, for the loan of the valuable and interesting collection of Faraday memorials shown in the library on the occasion of the two lectures on June 17th and 26th, given in commemoration of the Faraday centenary. The special thanks of the members were returned to Sir Frederick Abel, for his valuable present of an Œrtling balance, and to Mr. Ludwig Mond for his donation of £100 towards expenses connected with the Faraday centenary commemoration.

Received.—From Piper and Carter, "The Handbook of Photographic Terms," by William Heighway. This is the second edition, revised, and considerably enlarged, of an alphabetical arrangement of the processes, formulæ, applications, &c., of photography, and will be found very useful for ready reference.——From Messrs. E. H. T. Anthony and Co., New York, "The International Annual, 1891-2," edited by Messrs. W. Jerome Harrison and A. H. Elliott, with Mr. W. I. Scandlin as associate editor. The writers of articles, says the preface, "represent the cream of the brain force which lies behind the many advances in the science of photography"; while the illustrations "are well fitted to demonstrate the present advanced state of process work." We shall in due course give a further notice of this annual, which contains 470 pages.——From Harry C. Jones, also of New York, No. 2 of "The Photo-American Review," which presents this month, as last, thirty-two pages of artistic illustrations, besides interesting and instructive papers on the subject of photography, and a description of general literature, with comments. Of this also we shall have more to say.——From the Albion Albumenising Company, their "Photographic Price List," 76 pages, illustrated, with index.——We have also received some of the cheap guide books by Percy Lindley, "Tourist Guide to the Continent," "Walks in the Ardennes," &c. These are excellently written and well illustrated. The publishing office is 125, Fleet Street.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

J. C. W. (Waldhausen).—*Ratios of Exposure.* We should put the snow-covered mountains in the first place as requiring least exposure—practically instantaneous; then the marine subjects or seascapes, which might take *double* the exposure of the former; and lastly, the open mountainous views, presumably lower slopes, which would require a longer time, dependent upon the distance of the principal objects from the camera. In ordinary cases give *three times* the period necessary for the snow scenes. Bear in mind, however, that trap rocks and black cliffs sometimes peep through snow fields, and that figures introduced into such scenes will demand a longer exposure than would otherwise be required.

Printer.—*Blisters on Albumen Prints.* It is important to notice at what stage these blisters make their appearance, for very frequently they only occur when the prints are immersed in the hypo bath, in which case the cure is to avoid too sudden a transition from washing liquors to highly concentrated solutions of greater gravity, by interposing a salt brine to work up gradually from weak to strong. Excessive dryness of the albumen film before sensitising often destroys adhesion and causes blisters. This you ought to be able to see at the time of preparation, and slight damping of the paper or the addition of a little alcohol to the silver bath will generally remedy this defect.

F. I. C.—*Coal-Tar Saccharine.* Dr. Fahlberg's preparation and the para-nitro ortho-toluidine are excessively sweet to the taste—many times more so than ordinary cane sugar—and on this account have been recommended for the use of diabetic patients.

Perplexed.—*An Unscientific Paragraph.* "The older method (of making alkali) in use is to force sulphur through common salt, the result being soda." We agree with our correspondent in regarding the above extract as a most superficial and erroneous account of the main distinction between the Leblanc and Brunner-Mond methods of proceeding, the only substratum of truth being the fact that no sulphur in any form is employed in the manufacture of soda by the last-named process.

Kent.—*Deal Pier Charges.* According to a report in one of the daily papers, a fee of ten shillings and sixpence is demanded for permitting the camera to be used on Deal Pier. Can this be true? For, if so, it would be cheaper to take a passage in a passing steamer, or hire a boatman to put off from the shore; or, better still, select another port, such as Ramsgate or Dover, for marine photographic operations.

F. R. M. S.—*The Weather Forecasts.* It cannot be said that the predictions for the first days of July, in the London district, were singularly fortunate. If reversed, they would have been nearer the mark. Thus, the 1st, 3rd, and 4th of July were to be "fine and warm," "fair as a whole," or "fair and bright"; but on these days we had heavy showers or torrents of rain; whilst on the 2nd inst., "changeable, fair to showery," was predicted, when we had not a drop of rain. The direction of the wind proved incorrect on some of the days, but possibly the error lies in attempting to make the same forecast do duty over too wide an area, for no rain fell in Eastbourne on the 1st, whereas London was treated to a deluge, and yet both are included in district 5, England S. (London and Channel).

Lab.—*The Society of Chemical Industry.* The annual meeting has been held during this week in Dublin, and was largely attended, Professor J. Emerson Reynolds, F.R.S., being elected president for the ensuing year.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1715.—*July* 17, 1891.

CONTENTS.



## PAINTERS AT FAULT.

Most of us experience a lively satisfaction, although we may not care to give it visible expression, when there comes under our notice a case in which the biter is bitten, or when the cutting edge of the diamond meets with some sharper crystalline angle and is itself cut. More particularly is this the case when some self-constituted judge of the actions of another, who has been in the habit of laying down the law and admonishing right and left, is himself caught tripping, and is found to be guilty of some of the very faults which he was so fond of looking for and correcting when committed by others.

It has for a long time been the fate of photographers to be hardly spoken of by a certain section of the artistic world, and to be told that in their work there is not and never can be any art at all. That they make use of a mechanical contrivance to produce their pictures, and the results cannot be otherwise than mechanical. Photography, in fact, represented everything in an unnatural manner, and those alone who possessed artistic genius and training were competent to look down from their high pedestal and point out that this was the case. In the meantime, if the poor photographer endeavoured to retaliate, and to suggest that such and such a picture exhibited faulty drawing, or could not in some other way be true to nature, he was promptly sat upon as one who knew nothing about the matter. And yet all the time that photographer could prove by his published works that he knew well enough the rules of composition, and that he possessed artistic faculties and knew how to make practical use of them. Many photographers, therefore, will be inclined to chuckle when they learn that "a Daniel has come to judgment," to tell some of these detractors of photographic work that they themselves are constantly guilty of offences of commission and omission against truth and nature which it would be impossible for any photographer to commit, and which, moreover, might often be avoided if the power to use a camera had been acquired. The Daniel to whom we allude is Mr. J. Normau Lockyer, F.R.S., who, in the course of a lecture delivered last month at Bedford College, on the subject of "Physical Science for Artists," took occasion to point out, while advocating the immense importance of a scientific training to artists, the lamentable mistakes commonly made by them for want of such training. He did not indulge in vague generalisations, but gave as examples of the errors adverted to certain pictures now hung at the Academy exhibition and other galleries.

Commencing with the importance to the artist of a knowledge of light—without which there could be neither art nor artists—he showed how many painters disregarded altogether the well-known rule that when light falls upon a body and is reflected, the angle of reflection must be equal to the angle of incidence. Reflection in landscape mostly comes from the surface of water, and the lecturer pointed out that many pictures, both in the Academy and at the New Gallery, transgressed this well-known law by making reflected objects apparent when they could not possibly be visible, and *vice versâ*. It is obvious that such a fault would be impossible in a camera-made picture, and here at least the artist can seek help, as so many of them wisely do, from the revelations of photography.

"Neglect of this same law is also to be found," we learn, "in very many pictures in which we get the reflection of the sun or moon in water," and although certain pictures in the Academy are commended for the admirable way in which such reflections are rendered, one is held up to scornful reproach as a something which is absolutely opposed to physical law.

Next we are told of an instance of artistic bungling that occurred some years ago in which, curiously enough, the artist was led into error from too closely copying a photograph; but we are happy to learn that the fault did not prevent the picture being hung at the Academy. It seems that a book had been published in France, and republished here as a translation, in which there appeared an admirable coloured picture of a soap-bubble. This was copied from a photograph taken in the laboratory in the Collège de France, a place of many windows. These windows were naturally reflected by the surface of the bubble, in the way familiar to anyone who has ever blown a bubble within doors. Now a certain English artist had painted a picture of a garden with some children playing in the foreground, and in order to give a little variety to the group he made one of the little ones to blow soap-bubbles. Unfortunately, however, instead of painting from an actual bubble, he copied the coloured photograph in the book referred to, the bubble with windows; but as gardens generally have no windows, the thing was a little out of place.

We are next told of a picture exhibited last year in which the dark half of the moon was turned towards the sun, and of a still stranger case in which, from the assumed position of the sun, the moon, to be correct, ought to have been painted *full*, but the artist had expressed it as a crescent. He owned that he knew it was wrong, and, in fact, had painted it full originally, but had altered it because "it destroyed the balance of his picture." "That, you see, is where the art comes in," added the lecturer at the close of his anecdote. In another case—the picture is hung in the present Academy exhibition—a painter has fallen foul of the well-known phenomenon of refraction, and has made the apparent bend in a body immersed in water to bend the wrong way. A rainbow seen as an arch viewed in perspective is, from its nature, a simple impossibility, and yet many artists have depicted a rainbow so, possibly because if it were otherwise rendered it might, as the mooney gentleman said, "destroy the balance of the picture."

Many other faults common to artists were pointed out and expatiated upon in this excellent paper, but the greater number refer to mistakes due to a wrong appreciation of the laws which govern colour in nature. In this domain the artist has it all his own way, and photography can be of no service to him; but where mere form is concerned, he will find that the camera can teach him many things, and may possibly be the means of preventing him falling into error.

## NEW ZINCOGRAPHIC PROCESS.

BY AUGUST AND LOUIS LUMIERE.

The method which we propose may be described as a modification of the albumen process. The facility and the rapidity with which it allows you to produce engraved images of the greatest delicacy and fineness, and the employment as a lined screen of a positive phototype, constitute incontestable advantages. The greater part of the mechanical processes in use require the employment of a reversed negative, which must be both transparent in the shadows and opaque in the lights—conditions somewhat difficult to secure—while the manipulations are of a delicate nature, and can only be carried out satisfactorily by experienced hands.

Our new method does not possess these difficulties of procedure, and, by following exactly the directions which follow, it is possible to obtain at the first attempt images perfect in their nature, and susceptible of furnishing excellent lithographic prints, or blocks ready for the typographic press.

The following solution is first of all prepared:—

| | |
|---|---|
| Water ... ... ... ... ... | 1,000 parts |
| Albumen (from fresh eggs) ... ... | 100 ,, |
| Bichromate of ammonia ... ... | 3 ,, |

(The amount of bichromate should be sufficient to colour the solution a light yellow.) This mixture is rapidly stirred, carefully filtered, and, by means of a whirling table, is spread upon a sheet of polished zinc, which has been previously carefully cleaned. As soon as the thin coating of bichromated albumen has been deposited on the zinc in this way, it is necessary to hasten the drying of the compound by lightly heating the metal plate.

The plate is then exposed to the light in a printing frame under a positive, and, when the exposure is judged to be sufficient, it is removed from the frame, and is given a coating of ink, thinned with middle varnish, by means of a roller. The colour of the surface should then be a dark grey, not black, and without any appearance of the image.

The plate is now immersed in tepid water, and before long the image begins to appear, and the action may be helped by lightly rubbing the surface of the zinc with a tuft of cotton-wool.

The image is a negative one, and the shadows of the picture consequently are represented by patches of bare zinc, the albumen on these parts having been protected during the exposure to light, and therefore remaining soluble. It is these portions that have been washed off in the bath of tepid water.

The plate is now thoroughly washed in plenty of water, and plunged into a solution of perchloride of iron at 35° B., in which it should remain from ten to fifteen seconds. It is now again washed and dried.

The zinc plate is next heated to about 50°, and a roller charged with black ink thinned with middle varnish is passed over it, when it will be found that the ink will adhere to the whole of the surface indiscriminately. By means of another roller, passed several times over the surface of the plate, it is possible to remove the ink from those portions still covered with the insoluble albumen. There only remains now to rub the plate with a soft rag charged with strong ammonia, when the image appears in black on a brilliant background of metallic zinc, for the albumen, although insoluble by light, is soluble in ammonia, and a second development is thus brought about which is the reverse of the first. By the friction, as well as by the action of the ammonia, the ink and albumen are removed, while the ink remains on those portions of the plate which have been partially engraved by the action of the perchloride of iron. It is the latter reaction which forms the basis of our method, and which constitutes its novelty. It is very curious to watch this reversal of the image under the influence of the ammonia. Solutions of potash, soda, &c., do not give such clean results, probably because of the saponification which is induced by the presence of the fatty constituents of the ink.

If the plate has to be printed from lithographically, there only remains to prepare it in the usual manner. If, on the contrary, we require the image to be in relief, it is necessary to sprinkle over the surface powdered resin, and warm it in the usual way before proceeding to the first etching, or biting-in with acid. In this latter case it is preferable to shorten the immersion of the plate in the perchloride of iron solution, in order to avoid roughening too much the surfaces which are ultimately destined to stand up in relief.

## THE PHOTOGRAPHIC CONVENTION.

"Convention week is generally wet," was a common remark heard at Bath last week, but, as a matter of fact, the weather cleared up after Wednesday, and for the rest of the week the members of the Convention had little to complain of in the matter of weather. The *Convention Group* on that day was taken in a pouring rain, and Mr. Ashman had to give the word to lower umbrellas, just as if he had been in command of a battalion of soldiers, and had directed them to present arms. Many pictures of the members were taken, for, in additiou to Mr. Ashman's camera, there were many others in positiou.

This very wet trip to the Sydney Gardens, where the group was taken, constituted the sole excursiou on Wednesday, which was, with this exception, devoted to business in the Guildhall. We have already recorded that a general meeting was held earlier in the day. In the afternoou, Mr. W. Lang, jun., F.C.S., read a paper, with illustrations, on "The Photographic Work of Herschel and Fox Talbot," which will be fouud ou another page of our present issue.

In the course of a few remarks in the discussion which followed, Mr. C. H. Talbot, a son of Mr. Fox Talbot, said there could be no doubt whatever that his father obtained definite photographic results in 1834 and 1835. He possessed a few views which he believed to be of the year 1835, but, unfortunately, conclusive proof of this was not forthcoming; but he judged their date from the fact that his father had stated that his earlier views of 1834 and 1835 possessed the characteristic of having (as was the case of the ones in question) their outline come out with distinctness; but the details were indistinct, and, therefore, differed from views dated 1839. There was another specimen of a fern leaf upon paper, of which the watermark was 1835. He should have pleasure in showing these views, and other unique examples of early photographic work produced by his father, to the members of the Convention who visited Lacock Abbey on Friday.

Mr. Lang's paper, which was much applauded, was followed by one by Mr. C. H. Bothamley on "Recent Developments in Printing Processes," which we print on another page, his remarks being rendered additionally interesting by a number of capital illustrations. The experimeuts were watched with great interest, aud at the close Mr. Bothamley was heartily thanked.

Mr. J. Traill Taylor then read a paper, written by Mr. Debenham, on "The Cult of Indistinctness."

There was a large atteudance at the evening meeting, when Mr. A. A. Common, F.R.S., favoured the company with numerous illustrations of recent astronomical photography shown on the disc by Mr. Pringle, and graphically explained by the lecturer. The photographs included representations of nebulæ, the planets Jupiter, Neptune, &c., and photographs of the moon in different stages, these latter showing a wonderful amount of detail. The lecturer was warmly thanked for his extremely interesting remarks and pictures, aud the meetiug terminated with the discussion of one or two matters of interest to the Convention.

On Thursday the members of the Conveution divided their favours between Salisbury and Bristol, to both of which places there were excursions, returning in good time for the meeting at the Guildhall in the evening, where there was a large attendance. The chair was occupied by the President (Mr. Bedford), and Mr. A. Haddon (Royal Naval College, Greenwich) preseuted the report of the Lens Standard Committee appointed to consider the adoption of staudard lens fittings and take steps necessary for their effective establishment. The report was a supplementary one to that submitted at Chester last year. It appeared that immediately after the last Convention the secretary of the committee appointed by the Photographic Society invited the committee to join them and consider standards with regard to lenses, and objections to certain others. The Photographic Society of Great Britain had adopted most of the suggestions which the committee at Chester made, and satisfaction was expressed at the fact that difficulties with the leading opticians had been overcome. Mr. Bothamley proposed the adoption of the report, and congratulated the committee upon the accomplishment of what might be regarded as the most important work the Convention had yet taken in hand. It must also be satisfactory to know that the recommendatious contained in the report had met with the approval of the leading opticiaus of the world, aud that the committee was in agreement with the Photographic Society. Mr. Levy seconded. In the discussion which ensued, Mr. Warnerke spoke as follows:—

There is one point in the recommended staudard I wish to direct the attention of the Convention to—viz., the unit of the rapidity of lenses. Some ten or twelve years ago the Photographic Society of Great Britain chose $f/4$ as the unit, and it is also recommended uow by the committee of the Convention. The ten or twelve years that have elapsed since the introduction of that unit is certainly long enough time to look back and examiue what is the practical outcome of that measure. Constant readers of our numerous publications cannot but observe that whenever the question of rapidity of the lenses occurs, the numbers of the unit standard are not used. The present meeting of the Convention offers au excellent field to verify the popularity of the measure. During our numerous excursions, when everybody is busy using his camera, the most uatural questiou in conversation is, what diaphragm do you use? This question invariably has been answered, $f/10$ or $f/6$, &c. Even members of the past and present lens committee, and opticians marking their lenses with unit standard numbers, do not use them when answering this constantly recurring question.

Certainly there must be something iu the measure proposed that is not practical. In reality, this staudard is not the best, and that, I think, is the reason why it is not practically adopted. It requires too much calculation that cannot be accomplished without pen or pencil. There are two other units —$f\sqrt{10}$, proposed by Mr. Dallmeyer, and $f/10$, adopted by the Paris Congress. To find the unit standard number for a certain diaphragm, it is necessary to find the square of the fraction representing relation of focus to the diameter of aperture of that diaphragm, and divide it by the square of unit diaphragm—viz., by 16 iu the case of the proposed unit, by 100 for French unit, and by 10 for Dallmeyer's unit. It will be readily seen that division of any number by 10 or 100, requiring only removal of the decimal point, is much simpler than division by 16.

However, this is not the only plea in favour of $f/10$ as a unit. We are going to the Brussels Congress, and certainly it will not be becoming to English photographic societies to propose a measure that is not the very best, and consequently one that has no chance of being adopted universally; $f/10$ is better than $f/4$, because it is simpler. It is already adopted by the Paris Congress, and it is clear that for these two reasons it will have all Congress iu its favour.

Supporters of $f/4$ unit put forward an argument that some opticians have already adopted the system for marking their lenses, and that any change of the system will put them to inconvenience. To that I can answer—and that not only on supposition, but as the result of inquiry—that those who have adopted already $f/4$ will adopt without hesitation any other system recommended as best by recognised authority.

There is also a great deal to be said respecting the system of weights and measures sanctioned by the last Convention. If we insist on the adoption of the system that is palpably inferior to the generally used metrical, we shall be put at great disadvantage at the Congress. The same is to be said respecting a system of weights and measures proposed elsewhere, recommending us to express our formulæ in parts. I shall put as an instance, how can you answer a question, "How much emulsion have you to use to cover a sheet of paper of certain size, using parts as measures?"

Photography, like all other sciences, is not national, but belongs to all humanity; therefore, we must use terms that can be intelligible to all humanity, and that is the object of the Congress. The metrical system is that universally intelligible expression of weight and measures.

Mr. Haddon mentioned that a deputation had been appointed by the Photographic Society to attend the Brussels Congress to support the suggestions adopted by them. The report was subsequently adopted with about one dissentient, and a hearty vote of thanks was accorded to Mr. Haddon for the trouble he had taken in the matter.

On Friday the members of the Convention divided their attention between Glastonbury and Wells, and Corsham and Lacock Abbey, privileges being afforded at each place for obtaining views, while at Lacock Abbey the additional advantage was obtained of inspecting the examples of early photographic art produced by Fox Talbot, dating from 1834 downwards. In the evening the Photographic Convention of 1891 was brought to a successful close in true English fashion by a dinner and smoking concert. All the arrangements of the week were carried out in a very complete manner, and we must congratulate Mr. Briginshaw, the energetic hon. secretary, on his talents as a successful organiser.

## SOME NEW ADDITION COMPOUNDS OF "THIOCARBAMIDE" WHICH AFFORD EVIDENCE OF ITS CONSTITUTION.*

BY J. EMERSON REYNOLDS, M.D., F.R.S., PROFESSOR OF CHEMISTRY, UNIVERSITY OF DUBLIN.

### D.—*Compounds of Thiocarbamide with partially substituted Alkylammonium Salts.*

The strongly contrasted results afforded by ammonium and by tetrethylammonium salts invested with much interest the examination of any compounds that could be formed by the union of thiocarbamide with partially substituted alkylammonium salts.

The products first obtained by the union of thiocarbamide with primary, secondary, and tertiary ammonium salts appeared to resemble those prepared with the simple ammoniacal haloid salts as described in A, that is to say, they seemed to be compounds of the tetrathiocarbamidammonium type. But the analytical data obtained with those products were not satisfactory; hence, as soon as time permitted, the work was repeated very carefully, with the results stated below.

The alkylammonium salts used at first were purchased, but those subsequently employed were prepared in my laboratory by the direct action of the required acid on the pure amine, so that ordinary ammoniacal salts were excluded. I shall first describe the results obtained with the diethyl compound; the chief interest attaches to it as being intermediate between ammonium bromide on the one hand, and tetralkylic bromide on the other.

*A compound of diethylammonium bromide with thiocarbamide* was formed when 3·8 grams of the bromide in *absolute* alcohol was boiled with a similar solution of 7·6 grams of thiocarbamide. On cooling, a crop of crystals was obtained which was evidently a mixture of thiocarbamide and a new compound, and contained only 12·08 per cent. of Br, but 31·53 per cent. of S; whilst its melting point was not sharp, liquefaction commenced at 135°, and was not complete under 145°.

The mother liquor, when concentrated, afforded groups of fine, thin prisms, resembling somewhat the ammonium bromide compound in its mode of separation. These crystals were drained, slightly washed with absolute alcohol, and recrystallised from the same solvent.

The melting point of this compound was sharp between 133° and 134°. Some months afterwards this preparation was recrystallised and was found to have the same melting point. It was observed that crystals began to form in the liquid at 174°.

A complete analysis was made, with the following results:—

| | | |
|---|---|---|
| I. 0·3575 gram gave | | 0·2075 $H_2O$ and 0·2891 $CO_2$. |
| II. 0·181 | ,, | 39·3 c.c. of N at 14° and 755 mm. |
| III. 0·228 | ,, | 0·427 $BaSO_4$. |
| IV. 0·272 | ,, | 0·131 AgBr. |

The formula $(H_4N_2CS)_3H_2(C_2H_5)_2NBr$ requires:—

| | Theory. | Found. |
|---|---|---|
| C ... ... | 21·99 per cent. | 22·05 per cent. |
| H ... ... | 6·28 ,, | 6·44 ,, |
| N ... ... | 25·65 ,, | 25·23 ,, |
| S ... ... | 25·14 ,, | 25·74 ,, |
| Br ... ... | 20·94 ,, | 20·49 ,, |
| | 100·00 | |

It is to be noted that this compound is very sensitive to the action of water; anhydrous alcohol must be used in its preparation, and if that used for recrystallisation be much hydrated, a mixed product is obtained which contains free amide and, possibly, a dithiocarbamide compound. Hence great care is required both in the preparation and purification of the trithiocarbamidediethylammonium bromide.

I have not succeeded in preparing a tetrathiocarbamidediethylammonium bromide; if it exists in solution, it is certainly decomposed when crystallisation takes place, even from anhydrous alcohol. At the time my former paper was written (*loc. cit.*), only a rapidly crystallised product, from a concentrated solution, had been obtained, and the bromine in that product was found to be near to the percentage required for a tetra-compound, but I am not satisfied that the material then obtained was homogeneous.

Diethylammonium chloride also unites with thiocarbamide and affords a silky mass, which, however, always contains some free thiocarbamide. The best product melted about 136°, but not sharply; and, like the bromide, when heated to 175° crystals began to form in the molten substance and increased in amount until the whole became nearly solid at 180°.

This somewhat impure material afforded 10·14 per cent. of Cl and 29·90 per cent. of S.

A trithiocarbamide compound requires 10·51 per cent. of Cl and 29·95 cent. of S, while one containing 4 mols. of thiocarbamide requires 8·6 per cent. of Cl and 31 per cent. of S. The latter is, therefore, excluded; hence the crystalline substance examined contains a sensible proportion of free amide adherent to the chloride of trithiocarbamidediethylammonium, analogous to the bromide already described.

*Triethylammonium Bromide Compounds with Thio-*

* Continued from page 485.

*carbamide.*—The earliest small experiment made with the salt and amide seemed to indicate that a tetrathiocarbamide compound was formed, but when the work was repeated on a larger scale, and the product slowly separated from alcoholic solution, it was not found possible to obtain a definite compound with 4 mols. of thiocarbamide under the usual conditions of the series of experiments. In all cases free amine separated along with any substance produced.

The proportion of bromide was then increased so that the solution contained 1 mol. to 3 of thiocarbamide, using 14 grams of the latter, and the materials were heated with absolute alcohol to the boiling point of the latter for three hours. When the liquid was allowed to cool, groups of silky crystals separated, which closely resembled the ammonium bromide compound. These were quickly drained off, washed with cold alcohol, pressed, and dried. The mother liquor, on standing over night, gave some more needles and a small crop of thiocarbamide crystals.

Although microscopic examination of the silky crystals showed that they were all of the same kind, and the ratio of bromine to sulphur in them proved to be 1 : 2·58 or, approximately, 2 : 5, slow recrystallisation failed to give the original substance, but, instead, two distinct forms were obtained—one portion consisting of groups of rather long prisms, resembling nitre in appearance, and the other of somewhat large, modified rhomboids; the latter were in smaller proportion and separated out more slowly, along with some more thiocarbamide.

The nitre-like crystals were separated, as far as possible, by picking and concentration of the liquids; they were redissolved in as small a quantity of strong alcohol as possible (as a large proportion of hot alcohol seemed to partly decompose the compound), and the crystals were again obtained, but in groups of smaller needles. These, indicated by *A* below, were analysed with the following results:—

0·2490 gram gave 0·4118 gram $BaSO_4$.
0·2222 „ 0·1081 „ AgBr.

When again crystallised from alcohol, a purer specimen of shorter crystals, marked *B*, was obtained; but even when absolute alcohol was used, some thiocarbamide separated from the mother liquor; gradual decomposition was found to follow further attempts at complete purification. The crystals were analysed as under:—

0·25 gram gave 0·4247 $BaSO_4$.
0·2798 „ „ 0·126 AgBr.

The two sets of crystals represent the compound $(H_4N_2CS)_3(C_2H_5)_3HNBr$ in somewhat different states of purity, thus:—

| | Theory. | *A* crystals. | *B* crystals. |
|---|---|---|---|
| S ... ... | 23·41 p. c. | 22·7 p. c. | 23·28 p. c. |
| Br ... ... | 19·51 „ | 20·7 „ | 19·16 „ |

The rhomboidal crystals which separated in small quantity along with the above, when washed with alcohol and recrystallised, were obtained in short prisms, and consist of the compound $(H_4N_2CS)_2(C_2H_5)_3HNBr$.

0·1532 gram gave 0·089 gram AgBr = 24·72 per cent. Br.

Theory for the above compound requires 23·91 per cent. of Br.

The mother liquor ultimately afforded a few fine, large prisms mixed with crystals of the other types, which were richer still in bromine, but the quantity of the material obtained was too small to admit of satisfactory purification for analysis.

*(To be continued.)*

## THE PHOTOGRAPHIC WORK OF HERSCHEL AND FOX TALBOT.*

BY WILLIAM LANG, JUN., F.C.S.

The two scientists whose photographic work is dealt with in the following communication were virtually contemporaries, and their connection with the town in which we hold our present Photographic Convention may be described as direct and indirect. Talbot's connection was essentially a direct one, living as he did within a short distance of Bath. Herschel's, on the other hand, has to be accounted for in the fact that his father, Sir Wm. Herschel, resided here for several years before his appointment as private astronomer to George III. necessitated his removal to Slough, in the neighbourhood of Windsor. To the student, therefore, of the history of photography, Bath will have something more than a passing interest for him—it will be for ever classic ground. I only wish that the summarising of the work done by Herschel and Fox Talbot had been placed in worthier hands than mine, but having been entrusted with the task I shall do my best to acquit myself of it.

In the first number of the *Edinburgh Philosophical Journal*, which made its appearance in June, 1819, the second contribution we find to be from Herschel, and its title "On the Hyposulphurous Acid and its Compounds." In the opening sentence we are told that the experiments about to be described are the result of an accident. Experimenting with sulphite of lime, and noticing a bitterness in the liquid when almost wholly decomposed similar to that of Epsom salts, and which could not be accounted for, Herschel was led to examine the properties of the body giving this characteristic bitterness, and which Herschel showed to be hyposulphite of lime. From the hyposulphite thus produced, other hyposulphites were prepared. In the memoir these salts, at all events the more important, have their properties described. The action of hyposulphite of soda and of the corresponding salt of potash on chloride of silver is distinctly set forth. Referring to the soda salt, we find it stated in the memoir, "Muriate of silver, newly precipitated, dissolves in this salt when in a somewhat concentrated solution in large quantity, and almost as readily as sugar in water." Herschel states it broadly that all liquid hyposulphites dissolve muriate, or, as we call it now, chloride of silver. He points out the fact that such a solution possesses great sweetness to the taste, and that most of the ordinary tests for silver fail to show the presence of that metal in the solution. He further shows that zinc can separate metallic silver on being immersed in the hyposulphite solution. In conclusion, it may be noted that the contribution is dated Slough, January 8th, 1819.

Herschel had evidently found congenial work in tracing out further reactions connected with the hyposulphites. In the same volume of the *Edinburgh Philosophical Journal* occurs another contribution—additional facts relative to the hyposulphurous acid. This appeared in the October issue, and the date affixed to the article is 15th May, 1819. Time fails us to refer in detail to the various facts brought forward, but one observation deserves to be noted—viz., that where silver iodide is described as sparingly soluble in hyposulphites. It has to be remembered silver bromide was then unknown. Bromine not being discovered till 1826, the salts of silver thus treated by Herschel were chloride, carbonate, phosphate, borate, matate, sulphite, and arseniate. The second volume of

* Read at the Photographic Convention.

the same journal has one other memoir, some additional facts relating to the habitudes of the hyposulphurous acid and its union with metallic oxides. This contribution is dated Slough, November, 1819. The true importance of these researches did not make itself manifest till some twenty years later, when the necessity of removing the unacted on silver salt from the developed image became apparent. Daguerre and Talbot's methods, as first propounded by their respective authors, were far from perfect, being images not sufficiently fixed. Herschel himself called the attention of these investigators to his early experiments, and the employment of hyposulphite of soda for the final operations made the Frenchman's and the Englishman's processes thoroughly complete.

As Herschel seems to have been the first to analyse coloured flames by means of a prism, it may be as well here to note the fact, although it may not strictly be termed photographic. In 1822, in the Edinburgh Royal Society Transactions, p. 455, a memoir is contributed on the "Absorption of Light by Coloured Media, and on the Colours of the Prismatic Spectrum, with an account of a ready mode of determining the absolute dispersive power of any medium by direct experiment."

In 1827, Herschel, among other articles, wrote that on light in the "Encyclopædia Metropolitana." Up to about this time Herschel had been an adherent of the emission theory of light; but the labours of Young and Fresnel had induced him to accept the undulatory theory.

In 1832, a short communication in the form of a letter was made to the British Association at their second meeting, which was held at Oxford. The title of paper indicates the subject matter, "On the Action of Light in determining the Precipitation of Muriate of Platinum by Lime Water."

Herschel went abroad in the latter end of 1833 to carry out a long-cherished desire to survey the heavens of the Southern Hemisphere. His destination was Feldhausen, six miles from Capetown, and here, for four years, were carried on those astronomical observations which will for all time be associated with the name of Herschel. I am not aware that during the period in question anything bearing sufficiently intimately on what may be called photographic research has to be recorded, although solar radiation observations were made from time to time. The third meeting of the British Association was held at Cambridge in the month of June, 1833. Two papers were contributed by Herschel, "On the Absorption by Light of Coloured Media, viewed in connection with the Undulatory Theory," and "The Principle and Construction of the Actinometer." It has to be noted that the instrument described was one destined to estimate the heating power of the sun's rays, not what we photographers understand by the title. The former paper appears only in abstract in the Association reports, but was printed *in extenso* in the *Lond. and Edin. Phil. Mag. and Journ.*, vol. iii., p. 401.

Before the Royal Society, on March 14th, 1839, a paper was read by Herschel, entitled "Note on the Art of Photography; or the Application of Chemical Rays of Light to the purposes of Pictorial Representation." At the outset the author states that his attention had been but recently called to the subject of Daguerre's concealed photographic processes, and that he had not known that the question had been considered by Talbot, or by anyone in this country; as an enigma to be solved, a variety of processes at once presented themselves. First, the so-called di-oxidising power of the chemical rays in their action on recently precipitated silver chloride; secondly, the instant precipitation of a mixture of platinum chloride and lime water by light, forming an insoluble compound, which might be blackened by various reagents; and fourthly, the decomposition of an argentic compound, soluble in water exposed to light in an atmosphere of peroxide of chlorine. Confining his attention to silver chloride, the author inquires into the methods whereby the blackened traces can be preserved, and the unaltered salt removed. This state of things can best be brought about by the use of the liquid hyposulphites. The author then specifies other salts of silver more sensitive to light than the chloride, viz., the carbonate acetate and nitrate. Commenting on investigations to be made on the spectrum, he advocates that the spectrum be produced not by the prism, but according to Fraunhofer's method, by the interference of the rays of light themselves in passing through gratings, and fixed by the heliostat.

Accompanying the paper thus briefly referred to were twenty-three specimens of photographs, one a picture of the large telescope at Slough produced in the camera. Through the kindness of Prof. A. S. Herschel, I am enabled to show a photographic reproduction of the frame of the great telescope belonging, if not to this particular period of the year, at all events to several months later.

The year 1839, I need scarcely remind a photographic gathering, gave to the world Daguerre's method of securing "sun pictures," and as this had but recently been divulged before the annual meeting of the British Association, we find it engaging the attention of the Mathematics and Physics Section. Talbot's remarks will be referred to when I come to deal with his work. Herschel's contribution on that occasion was a letter addressed to the president of the section, wherein he stated that in experimenting with Talbot's paper and exposing it to the spectrum he got coloured impressions. He also records the action of the red rays on paper which had, in the first instance, been exposed to light. On the 20th February, 1840, Herschel presented to the Royal Society a paper entitled "On the Chemical Action of the Rays of the Solar Spectrum on the Preparations of Silver and other Substances both Metallic and Non-Metallic." The reading of the paper extended over three meetings, viz., 20th and 27th February and 5th March. The whole memoir is full of suggestive material; there is only time to note one or two of the more important points. The terms positive and negative are here introduced for the first time to indicate respectively pictures in which the lights and shades are the same as in nature, and in which they are the opposite (par. 8), and these distinctive terms remain with us to this day. The first part of the memoir is devoted to the fixing of photographs, and the comparative merits of hyposulphites, potassium iodide, potassium ferrocyanide, &c., are discussed. The bleaching of the image by mercuric chloride is here recorded (par. 19). The second part relates to the taking of photographic copies and transfers. The third treats of the preparation of photographic paper, the photographic possibilities of lead compounds. The author describes a method of precipitating on glass sensitive silver compounds, and refers to such films being likely to lead to an extension of the art of photography. After stating results of his experiments with iodide, bromide, and chloride of silver, he suggests that similar experiments be made with silver fluoride. Gold and silver salts were also experimented on.

*(To be continued.)*

## THE DIAZOTYPE PROCESS OF PHOTOGRAPHIC DYEING AND PRINTING.*

BY JOHN CARBUTT.

The subject I have the pleasure to bring before the Section this evening is the "Diazotype Process of Photographic Dyeing and Printing," the discovery of Mr. Arthur G. Green, of London. It is a new method of producing designs in fast colours on cotton, linen, silk, paper, &c., either from hand-drawn designs on a transparent or semi-transparent medium, or by use of a photographic transparency. It was first made public at a meeting of the British Association for the Advancement of Science, held at Leeds last September.

It is distinctly a positive process; that is, it yields a positive from a positive. The operations are five in number, viz., dyeing, sensitising, printing, developing, and washing, corresponding very closely in number of operations required in preparing and printing on paper by the direct silver process of photographic printing. Primuline is the base of the new "diazotype," and is already in extensive use for dyeing calico in various tints.

*Dyeing.*—The first operation, then, is to dye our material with "primuline." To do this take 100 grains of "primuline," add to it 20 ounces of distilled water brought to a boil in a flask over a Bunsen burner; when dissolved, pour into a porcelain dish, and immerse the fabric, cotton cloth (the cotton must be free from dressing), or silk, and as soon as the pieces seem thoroughly impregnated with the dye, remove and rinse in plain water, and squeeze as dry as possible, or place between sheets of blotting-paper. The fabric so prepared has a primrose hue, and so far is insensitive to light.

*Sensitising.*—The second operation, or sensitising, is accomplished by immersing the dyed fabric in a solution formed of sodium nitrate, 60 grains; cold water, 32 ounces; oxalic acid, 100 grains, previously dissolved in two ounces of water. Each piece is immersed separately and soaked for two or three minutes; it is then rinsed in water and dried. The colour of the fabric should be of a reddish-yellow hue, and is sensitive to light. The operation should be performed in a weak light, and the pieces dried in the dark.

*Printing.*—Place in a printing frame a glass transparency, and place over it a diazotised fabric in contact, and expose to daylight ten to twenty minutes, or sunlight four to seven minutes. The greater the contrast in the transparency, the greater will be the contrast in the finished print, the action of daylight being to decompose the azo derivative, and so prevent reaction with the "developers," so-called, to be afterwards applied; but if we take a piece of the sensitive material that has not been exposed to light, and apply one or more of the developers, or, as a dyer would call it, a "mordant," we at once develop the full tint or colour by the action of that particular solution used. This I will now illustrate.

*Developing.*—I have here a piece of porcelain coated with a solution of gelatine and primuline, and sensitised in the same bath as the cotton cloth. I now paint over one-fifth of its surface, consecutively, with each of the following five solutions or developers:—

No. 1 develops a red colour.
No. 2 produces a yellow.
No. 3 produces an orange.
No. 4 produces a purple.
No. 5 produces a dark brown or black.

* Read before the Franklin Institute (Chemical Section).

It only remains to well rinse this in water, when the colours will be found fixed and permanent. This demonstration will illustrate the possibility of producing the several colours on one and the same picture, as follows: Mix a portion of each developer with a thin starch paste, and, with a camel's-hair pencil, paint over the parts wanted of a particular colour with the particular solution intended to supply that colour, of course in a weak light, as the image is faintly visible after exposure under the transparency.

The composition of the five developers just used is as follows—and it is only right to say here that I am indebted for the formulæ of these solutions to two photographic journals, *The British Journal of Photography*, and *Anthony's Photographic Bulletin*:—

DEVELOPERS.

| | |
|---|---|
| *No. 1.—Red.* | |
| Betanaphthol ... ... ... ... | 30 grains |
| Caustic soda ... ... ... ... | 40 ,, |
| Water ... ... ... ... ... | 10 ounces |
| *No. 2.—Yellow.* | |
| Crystallised carbolic acid ... ... | 50 grains |
| Water ... ... ... ... ... | 10 ounces |
| *No. 3.—Orange.* | |
| Resorcin ... ... ... ... ... | 30 grains |
| Water ... ... ... ... ... | 10 ounces |
| Caustic soda ... ... ... ... | 45 grains |
| *No. 4.—Purple.* | |
| Naphthylamin ... ... ... ... | 60 grains |
| Water ... ... ... ... ... | 10 ounces |
| Oxalic acid ... ... ... ... | 6 grains |
| *No. 5.—Black.* | |
| Eikonogen ... ... ... ... | 50 grains |
| Water ... ... ... ... ... | 10 ounces |

Transparencies on glass, and positives on celluloid and opal, can be produced, as shown by the specimens I have here.

The composition of the coating is as follows:—

| | |
|---|---|
| Water (distilled) ... ... ... ... | 20 ounces |
| Gelatine ... ... ... ... ... | 1 ounce |
| Primuline ... ... ... ... | 80 grains |
| Chrome alum ... ... ... ... | 2 ,, |

Put the gelatine to soak in six ounces of water, dissolve the primuline in twelve ounces of hot distilled water, and when dissolved add the gelatine and the chrome alum—dissolved in the remaining two ounces of water—filter through cotton, and flow while warm on the glass or porcelain. When dry, immerse for two minutes in the sensitising solution, wash for five minutes, and allow to dry in the dark. The operation of printing and developing is the same as for prints, or cotton, &c.

---

Broken Negatives.—A very useful receipt for repairing broken negatives is given by *Wilson's Photographic Magazine*. Place the negative, gelatine side down, on a plate rather larger than the negative. Coat the edges of the fragments with warm Canada balsam; join them together, using strong pressure. Remove the excess of balsam, then cover the negative with another plate exactly of the same size, and previously coated on one side with the following varnish:—

| | |
|---|---|
| Sandarac ... ... ... ... | 3 grammes |
| Mastic in tears ... ... ... ... | 3 ,, |
| Sulphuric ether ... ... ... | 50 ,, |
| Benzole (pure) ... ... ... ... | 25 ,, |

Lift together the three plates, turn them over, remove the large one that has served as a support, scrape off from the gelatine side the balsam that may have exuded, then surround the two plates with strips of gummed paper. Heat slightly the fragments before joining them together. This process will yield a print upon which no trace of breaking is to be seen.

## Notes.

The Convention week at Bath will long be remembered by those who were able to be present as a very pleasant and profitable one—the pleasantness being represented by friendly meetings and greetings, and the profit derived from the many excellent papers read. It is true that there was a little unfavourable (convention) weather at the beginning of the week, but this cleared off, and there remained plenty of sunshine for the remaining days. A really successful week of this character, carried out as it was with a complete absence of friction, cannot be organised without plenty of hard work by those at the helm, and the members should not forget this. To Mr. Brigginshaw, the hon. secretary, must be accorded the chief praise, and he, we are sure, will be the first to admit that he met with much goodwill and responsive aid from others. May the next merry meeting pass off as merrily.

Those photographers who are interested in matters artistic —and there are few now-a-days who can afford to do otherwise—would do well to read the course of lectures recently delivered before the Society of Arts on the "Decorative Treatment of Natural Foliage." Here they will pick up plenty of hints which are sure to be of service to them in a number of ways. But, even if we see no immediate result, commercial or otherwise, from a study of this kind, we must know inwardly that the acquirement of such knowledge is in itself a good thing, which cannot fail to reflect itself upon our every-day doings.

Police-court trials are more often held *in camerâ* in Paris than they are on this side of the Channel; but it is not often that a trial takes place *in camerâ* which has for its principal feature the wrongful use of the photographic camera. Such a trial has, however, recently terminated in the French capital, a man of the name of Schneider having been arrested in the neighbourhood of Stains as he was taking photographs of the forts. Of course, it was at once taken for granted that poor Schneider was an agent for the German Government, and, that fact being satisfactorily established to the minds of his judges, he was fined £120, and, at the same time, condemned to five years' imprisonment. Poor Schneider! Is he really a German spy, or some innocent tourist who has been thus used as a scapegoat?

In a bicycle race the other day the judge declared the result to be a dead-heat. But there happened to be a camera on the ground, and the finish of the race was photographed. In the resulting picture, which we have carefully examined, one rider, A, is clearly in front of the other, B. Of course the judge's ruling was accepted—for at the time the picture had not been developed—and the race was run over again. A was now clearly the loser, and the prize went to B. In such a case should the ruling of the judge be upheld, or should the photograph decide the question?

There is one industry in the higher grades of which England occupies the first place. Germany can make cheaper glass than we can, but she cannot compete with us in the better kinds. The German manufacturers of dry plates have discovered this fact, and, in consequence, are complaining of the high duties which have recently been imposed on imported glass. As a result of the tariff, the price of English glass has increased about 50 per cent., and the dry plate trade has been seriously affected. The German photographers, we are afraid, will have no alternative but to pay the increased charges, as the duty will apply equally to the coated glass of the English dry plate manufacturer, as to the uncoated glass imported for the use of the German manufacturer. Possibly the result will be an impetus to film photography.

It is doubtful whether sufficient attention is paid to the framing of photographs. At one time, when a photograph was framed, an acre or so of white margin was considered indispensable. We grew out of this, and went to the opposite extreme, abolishing the margin altogether. It is, perhaps, difficult to lay down a rule which shall apply to all photographs, as so much depends upon the subject, the size, and the tone of the picture. It is pretty clear, however, that the choosing of the frame must not be left to the frame maker. A glance at the various picture galleries is sufficient to show that painters, as a rule, are very fastidious on this point. It is said that most artists now design their own picture frames. If this be needful in the case of a painting, much more is it necessary in regard to photographs.

Photography has not, it would seem, quite lost all its attraction, since a feature of the new Cleopatra Swimming Baths, on the Thames Embankment, is to be a first-class photographic studio. We do not quite see the connection between swimming and photography, but this does not matter very much. The public have been photographed in every kind of dress, from foot-ball pants and jersey to fancy costumes, and we do not see why they should not be photographed in their bathing dress if they so wish it.

The correspondent of the *Daily News*, in describing the lamentable accident on Mount Vesuvius, relates the experience of Dr. Johnson Lavis, who had been on the mountain the whole of the previous day and night taking photographs. Lying on the crumbling edge while a companion held his feet, Dr. Lavis was able to measure the precipitous walls of the shaft, which went sheer down for 170 feet to the glowing lava at the bottom. We are not told whether in this position Dr. Lavis photographed the sides or bottom of the crater, but we should fancy so enthusiastic a photographer would be certain to have a shot, despite the risk.

No one has yet succeeded in photographing Lo Bengula, king of the Matabeles, so that there is one world left for Lord Randolph Churchill to conquer if his lordship has a camera with him. Lo Bengula, like Unibandine, his cousin, and other native potentates, has a rooted objection to being shot at by the camera. The surgeon who accompanied one of the expeditions was promised a "sitting" one morning, but the king had disappeared in the night. The surgeon followed him on horseback some miles, and then His Majesty's excuse was that no Matabele king could be photographed unless in full war paint, which he had not with him there; but it turned out, from a remark dropped by His Majesty to another member of the expedition, that it would never do for him to be photographed, as his people would think that part of him (his soul) had been taken from him.

## ARCHÆOLOGICAL PHOTOGRAPHY.

### CAMBER CASTLE, SUSSEX.

ANY person who may have walked along the fine level road which traverses the marshes between Winchelsea and Rye —a distance of about two miles—must have observed on his right, or east side, the substantial remains of a mediæval defensive work, or castle, consisting of a circular central tower surrounded by outworks, and now standing in the midst of a wide, green marshland, some considerable distance from the sea. This old fortress has been sometimes called Winchelsea, or "Combre" Castle, or "Camber-before-Rye," but is now always known as "Camber Castle," and is evidently a great object of interest to photographers, for we never visited the castle but we noticed one or two artists busily engaged with their cameras either inside or outside these picturesque ruins.

It must not be forgotten that the whole coast between Winchelsea and Romney has undergone a very remarkable change during the last few hundred years, and land, now appearing as green fields or marshes, was once covered by water, and was, in fact, a very extensive arm of the sea, reaching from Winchelsea to Romney on the east, and to Appledore on the north, part of which formed the harbours of Rye and Winchelsea. Many small estuaries, or "cambers," as they were sometimes called, indented these coasts, and it was for the defence of these harbours that the old castle was erected on one of these "cambers" (hence the name) midway between Winchelsea and Rye —a site very well chosen for such a work, because it was close to the water, and completely commanded the harbours on all sides. But, unfortunately, this camber gradually, but surely, went the way of former estuaries hereabouts, and in the course of a century left the castle high and dry nearly two miles from the sea.

The site of this fortress (like those of Sandown, Deal, and Walmer, in Kent) having been carefully surveyed and inspected by Henry VIII. himself in person, the castle was at once erected by order of that monarch in 1540, a period when many defence works were undertaken on the south-east coast, the king having, apparently, some fear of invasion by the Roman Catholic powers, who seemed much dissatisfied with Henry's "reforming" energy, and desired to induce him to return to "the ways of grace" by the gentle process of arms and bloodshed. The outlay for building this castle is said to have been £23,000, and this sum, together with the cost of the three Kentish castles already named, is reported to have been raised out of the spoils of Canterbury Cathedral, and the robbery and plunder of some of the religious houses.

Camber Castle consists of one large circular central tower or keep, surrounded by small towers or lunettes, connected by short curtains. A low battery once existed below the keep, with openings for guns, and loop-holes for small arms; but these are now choked with accumulated earth.

In Elizabeth's day it was a place of much importance, and was repaired by her in 1584 at a cost of £171 13s. 4d., and was armed with nine guns, thus described: "1 iron canone, 8 brasse culverins, demi-culverins, and sacres." As the sea gradually retired, however, the castle became of less and less utility, and in 1626, in the reign of Charles I., it was abandoned as a defence, and its guns and stores removed. Subsequently, in 1642, the Parliament ordered it to be entirely dismantled, and most of the materials sold, exactly as Sandown Castle in Kent was treated about thirty years ago.

The building is now a mere shell, but is still an object of much artistic interest, and forms a very picturesque ruin, reposing in the midst of the wide stretch of green marshland and meadow, and will always very well repay a visit from both the artist and the photographer. It is open to the public.

## PRELIMINARY, SECONDARY, AND SUPPLEMENTAL LIGHTING.*

BY DR. J. M. EDER.

IMMEDIATELY after the publication of this statement, Blanquart-Everard stated that he obtained pictures in shorter time when the interior of the camera was white instead of the usual black. This was substantiated by Kilburn, but denied by Claudet, or at least restricted to such cases where the outer light was not strong enough to form a strong image. Notwithstanding these experiments, they were again brought up by Blair twenty years later, but he soon returned to the dark camera and a preliminary exposure under red light.

Günther, in Hanover, 1855, suggested a modification in which he advised a blue lilac colour in place of black. As a matter of fact, some photographers (Bellac and others) actually reduced the time of exposure with similar apparatus. In the resulting discussion, in which Horn was especially active, it was soon shown that the reduction of time was at the expense of the picture, as the negatives were always flat. As a matter of fact, neither the quantity nor intensity of light within the camera is under any control; and even if in some exceptional cases the requisite measure of supplementary lighting is attained, in the great majority of cases it results in failure. Consequently this expedient is practically useless; it is far more unreliable than the previous processes.

Carey Lea condemned the white and red interiors of the camera. Especially with a strong light (landscapes, &c.), the bright high-lights would spoil the whole view, and result in fog and flatness. De Constant, who again investigated the matter in 1870, found that an entire white camera resulted in a flat picture, little relief, and a confused appearance, as if the plate had been wiped over. If the top and bottom of the camera were black, and the

* Continued from page 493.

sides white, the resulting picture combined sharpness with softness and relief, especially on the part towards the black sides. If the bottom of the camera was black it added to the clearness of the face; if the top of the camera was dark the clothing was clearer. Consequently, as the face in relation to the drapery usually has too much light, better results were obtained when the top and sides were white, and the bottom black. As will be seen from all the above suggestions, no precise method has been evolved which could be adopted in regular practice.

2. *Primary and Secondary Lighting of Gelatine (Bromide of Silver) Dry Plates.*—Gelatine dry plates may also be improved during development if the necessary caution is used. It is, perhaps, superfluous to remark that with the greater sensitiveness of the gelatine dry plate, it is much more difficult to gauge the correct time for supplemental lighting than with the wet collodion plate, and the difficulty of preventing fog is greatly enhanced.

With extra rapid dry plates the period of the primary action is so exceedingly short that even with a slight light-impression a developable image is obtainable, and even the shortest lighting causes a general reduction (fogging). On the contrary, on less sensitive, clear-working plates a marked effect is shown by additional lighting. Candle-light can only be used for this purpose at a very great distance, or when greatly weakened. According to Eder, candle-light worked better when thrown through a ruby glass. His experiments showed that in a slow dry plate of 15 Warnerke, after being exposed from two to six minutes immediately in front of a ruby lamp (candle-flame), the sensibility was raised to 19-20 Warnerke sensitometer, which was equal to a plate three times as sensitive.

E. Himly, in Berlin, patented a so-called (Hilfsbelichter) auxiliary exposer, which introduced diffused light into the camera (D. R. patent 38, 684, August 6th, 1886); *vide* Eder's Year-book, 1889, p. 87. Preliminary lighting with dry plates of high sensibility is partly unnecessary, partly dangerous, and therefore is not advisable in actual practice. In all probability the same results obtained on gelatine dry plates by auxiliary exposure may be reached in a purely chemical manner without the action of light. A minimum reduction of silver bromide must be introduced. This takes place by extending the so-called ripening process. In fact, the continuation of the digestion of the emulsion leads to fogging, and otherwise it is exceedingly dangerous to the rapidity of the emulsion, when treated with reagents, which are apt to change the reduced bromide (sub-bromide) back to its normal condition.

At the conclusion of the reading, Mr. Carbutt inquired on what date the first coloured diaphragm was used in the lens.

Mr. Sachse said he did not know the date, but it was first used by Guillard.

Mr. Carbutt stated that he had used a coloured diaphragm in 1858 or 1859. He was then working in a small gallery in a small way, in an interior town in Indiana. They were using the wet collodion process at that time. He used a blue diaphragm, and obtained a sharp picture in about the same time that would have been required by a very much larger aperture.

Mr. Bell said that in 1872 the photographer of the Treasury Department and himself instituted a series of experiments in preliminary lighting. The plate was exposed from three to five seconds with a red glass in front of the lens, and then exposed on the sitter. The result in all cases was less valuable than if they had not exposed to the red light at all, but had given it proper time. It might be useful where a man's chemicals were in a very insensitive condition, as it would help him to make a much better picture than he could otherwise obtain. He had also used the blue light, by apertures in front of the box, and again in the cap, and after exposure swung in front of a white screen for an instant. At that time he had slow light, and this method helped him very much to get certain pictures, such as children. Still, the results were never very good, not as perfect as would have been the case had he been able to expose the proper time.

The Chairman inquired which colour gave the best results, the blue or the red.

Mr. Bell replied that in the preliminary lighting he found the red glass was the best.

Mr. Cheyney said that it seemed to him they all used this preliminary, &c., lighting. While it was not intentional, they all did exactly what Mr. Sachse had described. In the first place, they took out their plates in a dark room lighted by red light, dusted them, and inserted them in the holders; that was the preliminary lighting. Then they exposed the plates; that was the secondary stage. Next they developed under the red light, and if the development did not proceed fast enough they held the plate up close to the red light to see what was the matter. That was the supplemental lighting. Hence, they all did what Mr. Sachse had described.

In reply to a question from the Chairman, Mr. Sachse said the red light employed was merely the ordinary red light of the lantern.

The Chairman asked where, then, lay the difference between this red light and that used in ordinary development.

Mr. Sachse stated that it differed in this respect, that he personally always filled his holders in the dark. Then, after exposure, he never subjected the plates directly to the red light of the developing room, but put them in the pan in the shadow, and, after a few minutes, held them to the red light to see if the image had appeared. He was always very careful to keep away where the exposure was normal.

Mr. McCollin said he recollected one of the members, Mr. Browne, in the old collodion-emulsion days, brought to him some undeveloped plates; and they were made into fairly good plates by means of candle-light. They were developed in a yellow glass dish.

Mr. Cheyney explained the test he made of his lantern. He exposed a 26 Seeds plate before the lantern for five minutes with a figure cut from cardboard in front of it, and could get no image—the plate was perfectly clear. So he came to the conclusion that he was quite safe in taking his time in development.

Mr. Sachse remarked that he found a difference in the makes of plates. In one make of plates exposure to the lantern invariably resulted in fog. Two other makes he was in the habit of using always came out clear.

The Secretary inquired if this was really an improvement, or only a slight veiling which, as Mr. Carbutt said, made certain details apparent, or softened down the hardness of an under-exposed plate.

Mr. Sachse's experience had been that it did bring out detail. In speaking of the matter three years ago with a professional photographer, that gentleman attributed the improvement to pouring off the developer and leaving the plate exposed to the action of the air. He contended the ruby light had nothing to do with it, and said that when he found under-exposed plates he poured off the developer, exposed to the air, and then put them in the developer again.

The Secretary said it seemed to him that plates grew in detail while being examined, as though the air, coming in contact with the plate, might have that effect.

Mr. Walmsley supposed every one working with a developer had experienced that. His own developer he kept on the plate only long enough to bring out the detail slightly; he then poured it off, put a cover over it, and it would bring out a density in a few minutes so dark that they could not see through it.

Mr. Ives stated that more density would be developed where the air came in contact with the plate than where it was kept from it.

Mr. Cheyney mentioned an instance where he had allowed the negative to rest on the edge of the dish, and the part exposed to the air was better developed than the portion immersed in the developer. In fixing, also, he had found that where the process was slow it was quickened by taking the plate out and letting it stand on edge a little while before returning to the bath. There seemed to be some oxidising action of the air that helped development and fixing along.

Mr. Fox said that in the collodion emulsion days, when they worked with yellow light, it was a common dodge to pour the developer off the plate and let it stand for some time. The negative would come up very well in that way; it brought the detail out rapidly.

Mr. Stirling said it had been suggested that part of the action or the benefit brought about by breathing on the plate was due to the added heat; but he wished to ask for some information. What Mr. Cheyney had said about his developing lamp was at variance with his experience. He had never handled any plate that he could expose within five inches of any lamp he had ever seen without developing fog. He thought it would be interesting to all present if Mr. Cheyney would tell what lamp and what coloured medium he used.

Mr. Cheyney stated that his lamp was a Carbutt's Multum in Parvo. It had a face of ruby-coloured hammered glass in front of it. This he had the misfortune to break, so he took two pieces of Carbutt's yellow paper, and pasted a piece on one side, and one on the other; and he could stand a Seeds 26 plate in front of it, with a figure against it, for five minutes, and nothing but clear glass could be gotten out of it.

Responding to a remark from Mr. Stirling, Mr. Cheyney said he was never more than eighteen inches or two feet away from the lantern, and he could see the details come up, and he had not very good eyes.

Mr. Stirling hinted that as Mr. Cheyney wore glasses he could probably see better than he (Mr. Stirling) could.

This Mr. Cheyney denied, and, continuing, said that when he desired to tell the density he always examined the plate by the clear, red glass in the door of the lantern.

Mr. Bell spoke in favour of the sodium core, or "Aladdin" lamp, used by Mr. Rau. He advocated plenty of light in order to distinguish the density of the plate.

Mr. Rau, in answer to a question, said the sodium core gave a very pale orange light.

Mr. Sachse inquired whether any of the members present had ever had experience with the white or coloured camera interior.

Mr. Bell said that, in the old Daguerreotype times, they had used something like that, but it was abandoned, mostly for the reasons given in Mr. Sachse's paper. The images obtained were very indifferent.

Mr. Ives thought it would be of interest to the members to know that, in the old wet-plate days, a secret method was sold to photographers for $10.00, which consisted of a lighted wax match, to be held until burned out—a very convenient way for supplemental lighting.

## PROPOSED INTERNATIONAL STANDARDS.*

BY LEON WARNERKE.

Responding to the invitation of the past president of Convention to open the discussion on "International Photographic Standards," proposed by the last Paris Congress, I have been prepared to give a detailed account of the work done by the Congress, but want of time decided me to shorten that part of my paper, referring persons interested to the article of *Photography*, published July 2nd, entitled "International Photographic Standards," by C. H. Bothamley, and containing abstract of the decisions of the last Paris Congress.

It is useless to dwell on the extreme importance and imperative urgency of putting our houses in order. Photography has grown to such an extent, so numerous are its applications, that I can compare it to a huge central factory, surrounded by others producing everything that constitutes human industry—social and domestic comfort, science, art, commerce, and trade; all these surrounding factories depending on the central one. It will not only produce some materials and tools necessary, but often control and verify its works. Its resources are inexhaustible; it is capable of supplying any demand. One thing only causes a great anxiety—there is no harmony among different departments of the central factory, and even among the individual workers of the separate departments. They not only each use different tools, different patterns, models, shapes, and sizes, but even different denominations, somewhat like the workers of the Tower of Babel.

To avoid the fate of the unfortunate tower, we must put order into our house. This country was the first to feel the necessity of that order some ten or twelve years ago. That was a good beginning, but it affects only one department of the central factory, and only a very small branch of that department.

That Babelian condition is felt very painfully everywhere where photography is used, and where is it now not used? And that was the motive that brought forward the scheme of the Photographic Congress—universal or international. The first idea was generated in Belgium in 1884. Some unfortunate circumstances prevented the Belgians from organising that Congress in their own country, and the French, taking advantage of the Universal Exhibition of 1889, decided to hold a Photographic Congress. A committee appointed by the Paris Photographic Society, and consisting of the leading luminaries in the French scientific world, prepared a series of questions, and submitted their own solutions, which, after slight discussion, was embodied in the resolutions indicated above.

No doubt the labour of that Congress was great and conscientious, but, unfortunately, the place of congress was not well chosen. Foreigners (from political considerations) did not take part in the deliberation, and that is the reason why the resolutions of the Paris Congress are one-sided, and not international enough. However, the final decision, that the labour of the Paris Congress is to be continued by the following periodical congresses, offers the opportunity to amend indicated shortcomings.

The next Congress is to take place at Brussels, in Belgium, in 1891, from August 23rd to 30th. No better place can be chosen for the Congress. It is central, and the ground politically neutral. Photographic societies of all the world are preparing by sending delegates of their own to submit resolutions and take part in the discussion at that Congress. My object in this communication is to draw the attention of this Convention to the necessity—nay, to the urgency of putting our shoulder to the common wheel. Here I cannot sufficiently accentuate the fact that any photographic standard adopted will not confer complete benefit unless it be universally adopted, and, consequently, international. In order that it can be adjusted to the conditions of this country with the smallest friction, representatives of this country must contribute to its shape, and that is the reason why our duty is to be strongly represented in Brussels.

The organisers of the Brussels Congress have already issued a programme of that Congress. It is physically impossible to discuss the details of the Congress during the few hours this Convention has to exist. Therefore, I think it will be reasonable to appoint delegates and a special (active) committee, whose duty shall be to examine the programme and draw up the instruction for the delegates. If any chosen representative pleads want of know-

* Read at the Photographic Convention.

ledge of the French language, I can assert with sufficient probability of correctness that if English be spoken in the Brussels Congress it will be perfectly understood.

I know that many, even endowed with clear and independent appreciation of things, are apathetically awaiting the sanction by Act of Parliament of an alteration of the impossible habits and rules made by our forefathers.

I am sorry to say that study of the spirit of the House of Parliament will soon persuade any careful and independent observer that sanction by the Act of Parliament of the alterations so urgently demanded is unobtainable. Here is one example: Every year influential deputations, including all Chambers of Commerce of the Kingdom and other bodies, approach Parliament asking for the adoption of the metrical system of weights, measures, &c. Here is an extract from the *Times*, May 9th, 1891, of the last attempt:—

Mr. S. Montagu, M.P., Sir William Thompson, Mr. J. E. Dowson, and Mr. Alexander Smith, on behalf of the Decimal Association, then spoke in favour of the introduction of the decimal system, especially as regards weights and measures.

Mr. Goschen, in reply, said that was not a new subject to him, as they were aware, and if he were a young and active politician he might share in the movement with some faith that it might be of advantage to the country if carried out. But such experience as he had had was that they could not undertake a more difficult and complicated task, or one in which they would be baffled more at every step, than to undertake the revision of our currency, which touched everybody in this country, or the weights, which touched such an enormous class. He could perfectly understand that they might persuade people of the advantages of it, but to change the weights, for instance, must interfere with, and confuse for a time, the transactions of almost everybody in the country, and all those would be satisfied who gained by the change; while, on the other hand, an enormous body who would lose something would be dissatisfied. He did not wish to discourage them, but, if Mr. Montagu could induce the House of Commons to appoint a select committee to inquire into the subject, he would have no objection, though he could not see his way to recommend the Government to appoint a Royal commission. To carry out the change would affect everybody's transactions, and the innate conservatism of the English people—with regard to their habits, he meant, and not politically—would make it an extremely difficult task to carry out. It would be a task which could be undertaken only when there was no other work to be done, when there was general, profound political peace, and when everybody would be prepared to look with the most friendly eye upon every change which might be made. Everybody would have to learn the new weights and measures, and the more ignorant would go to the wall, so that it was highly probable that the tradesman, being more educated than most of his customers, would gain an advantage. He admitted that he was not arguing the question on high grounds, but on practical grounds. He ventured to think that the country was not ripe for a revolution which would affect all their transactions, and he could hold out no hope that the Government would take the initiative in the matter. He would watch the progress of public opinion on the question, for he admitted it to be a reform which would be accompanied by great advantages, but it could not be done unless the country were satisfied, for the sake of ultimate advantage, to go through very great present inconveniences.

In the same issue of the *Times* we find the reason why the question affecting the science cannot obtain the hearing of the legislators. The Earl of Meath, in the course of a speech in the House of Lords on May 8th last, pleaded for the necessity of introducing some instructive lectures in connection with museums, picture galleries, &c. In the course of his speech he says: "These art collections were purchased by our ancestors at a time when this country was, to a large extent, governed by the cultivated classes. Every day, however, England was becoming more and more governed by those who were less cultivated."

It is in the memory of everybody that a few years ago, when Sir Charles Dilke was approached by the advocates of the decimal system, the argument used by that stateman, which upset most logical pleading in favour of the system, was that the diameter of the halfpenny coin being exactly equal to one inch, it was impossible to make alteration.

From what was said, I conclude that, having no chance during the present generation of obtaining that Act of Parliament, we must count on our own forces, and introduce alterations recognised as necessary. This we can do without interfering with law. That was done by the scientist, and we are of the number.

## RECENT DEVELOPMENTS IN PRINTING PROCESSES.*

BY C. H. BOTHAMLEY, F.C.S.

Later developments of printing processes have proceeded along certain well-marked lines, the one common aim being to render the use of albumen unnecessary, and, in view of the want of permanency that characterises albumen prints, it will be admitted that the attainment of this result is much to be desired. For some time the development was all in the direction of the production of prints with a black or even blue-black colour, and we were affected with one of those attacks of artistic cant from which photography suffers now and again. It was urged that, quite apart from any advantage of greater permanency, the new prints are much more artistic, simply because they are black. The preachers of this faith seem to have forgotten that etchings and mezzotints, to say nothing of photogravures, are very rarely printed in black, and that some of the most famous etchers and mezzotint engravers have printed in very warm browns and, at times, in red-browns. Now I, for one, decline to admit that a black print is necessarily more artistic than a brown print simply because the one is brown and the other is black, and I welcome the still later tendency towards the production of prints with warmer colours, provided always that the prints are permanent.

Methods for the production of prints with warm colours—such as gelatino-chloride paper, alpha paper, and Lyonel Clark's platinum toning—are too familiar to require more than passing mention, and I propose to speak in detail of only two or three methods which are based either on novel principles, or on principles that have not hitherto been successfully applied in practice.

Platinotype has long been regarded as the first of the black printing processes; but the present very high price of platinum has stimulated investigation in the direction of replacing the platinum by some cheaper metal that will produce prints of the same character, and, as far as possible, with the same degree of permanence. So far, the only important outcome is the process that is known as kallitype, which in principle is precisely similar to the platinum process, except that the image is formed of metallic silver instead of metallic platinum.

Kallitype is based upon the old observations of Herschel and of Hunt, that when ferric tartrate, citrate, or oxalate is exposed to light, and thus reduced to a ferrous salt, and the ferrous salt is treated with a solution of silver nitrate, metallic silver is precipitated in quantity dependent on the quantity of ferrous salt that has been formed on each

* Read at the Photographic Convention.

part of the surface. Until quite recently these facts had not been utilised, but Dr. W. W. J. Nicol, working with a full knowledge of the chemical changes involved, has succeeded in producing a practicable printing method by making considerable alteration in the details of the process. Kallitype, in fact, is an excellent example of the way in which an old observation, apparently of little practical value, may become of very great utility in the hands of a man who has sufficient knowledge of chemical and other principles to develop it in the right direction and in the right manner.

The details of the process, as first published, are to be found in patent specification No. 5,374, February 15th, 1890 (the *British Journal of Photography*, xxxvii., 170-171; Photographic News, xxxiv., 207). Paper is coated with a solution of ferric citrate, ferric tartrate, or ferric oxalate, or mixtures of all or any of them, and is dried. It is then exposed behind a negative until a faint image is formed, just as in platinotype, and the image is developed by treating it with a solution containing 10 per cent. of sodium citrate, 1 per cent. of silver nitrate, and sufficient ammonia to just keep the silver in solution. The patentee recommends a solution containing 1·5 per cent. of silver nitrate; but I find that better results are obtained with only 1 per cent., and the best method of making up the solution is to dissolve the silver nitrate in a small quantity of water, add dilute ammonia very carefully until the precipitate formed is just, and only just, redissolved; then add the sodium citrate, previously dissolved in five or six parts of water, make up to the required volume, and filter. It is also recommended that a very small quantity of potassium dichromate should be added. The sodium citrate has the double function of dissolving the ferrous salt, and thus enabling it to reduce the silver nitrate, and of preventing precipitation of the iron by the ammonia. After development, the print is immersed in a 20 per cent. solution of an alkaline tartrate or citrate, made strongly alkaline with ammonia, and afterwards in two successive baths of a dilute solution of sodium citrate containing free ammonia. The alkaline tartrate or citrate removes the iron compounds, whilst the ammonia removes the silver compounds, and, finally, the prints are washed in water.

The chief objection to this process was the use of silver compounds in the developing solution, which, of course, was very liable to stain the fingers of the operator, and quite recently a modification of the process has been made, which not only removes this objection, but also enables prints to be obtained with a very warm colour. The silver salt is in the paper instead of being in the developer, and it is interesting to note that the modifications in kallitype have followed the reverse order to the modifications of platinotype; in the latter, the platinum was at first in the paper, but in the latest modification it is in the developer.

The specification of the patent of kallitype No. 2 is not yet published, but Dr. Nicol has kindly informed me that the paper is coated with a solution containing ferric oxalate, ferric nitrate, silver oxalate, silver nitrate, and nitric acid. It must be kept as dry as possible, but does not require the same minute precautions as the old platinotype paper. The pads, &c., of the printing frame must also be dry. My own experience leads me to the conclusion that care in this matter of keeping the paper dry is of very great importance.

The paper is exposed until the detail in the densest parts of the negative is very faintly indicated, the appearance of the image being very much the same as in platinotype, and it is then developed, the composition of the developing solution varying with the colour required in the finished print. For *black prints*, the exposed paper is immersed in a solution containing 10 per cent. of Rochelle salt, and 10 per cent of borax; for *purple prints*, 10 per cent. of Rochelle salt, and 2 to 5 per cent of borax; for *sepia prints*, 5 per cent of Rochelle salt, 1·25 per cent. of borax, and a small quantity of hydrochloric acid. In all three cases a small quantity of a dilute solution of potassium dichromate must be added. The dichromate keeps the whites clear, and increases the contrasts, and the character of the prints can be altered by varying the proportion of this salt; too high a proportion destroys the half-tones. The examples shown demonstrate this point very clearly; in each case two prints were made of as nearly as possible the same intensity, and one was developed with a solution containing no dichromate, the other with a solution to which the dichromate had been added.

The prints are allowed to remain in the developing solution for some time, in order that the Rochelle salt may remove the iron from the paper; and the excess of silver salt is then removed by immersing for about fifteen minutes in—

| | |
|---|---|
| Water ... ... ... ... ... | 80 parts |
| Strong ammonia solution... ... ... | 1 part |

The prints are afterwards washed in water.

My own experience indicates that, even after prolonged immersion in the developer, there is danger of iron salts remaining in the paper, with, of course, loss of purity in the whites, and I recommend that, after removal from the developer, the prints should be immersed in a ten per cent. solution of Rochelle salt before being put into the ammonia. After the Rochelle salt has been used frequently for this purpose, it may be utilised for making up fresh developing solution.

The black prints have a good colour, with a very slight bluish tinge, the whites are clear, and the gradations good. The sepia prints are not so satisfactory; the colour is often too red, and is sometimes not uniform throughout the print. It seems, in fact, that it is more important in this case that the paper should have been kept thoroughly dry. Prints should be somewhat deeper than for the other developers, and the developer, if used frequently, must be kept acid by addition of a few drops of hydrochloric acid.

(*To be continued.*)

## THE CULT OF INDISTINCTNESS.*

BY W. E. DEBENHAM.

Every now and then, in some field or other of art, a disturbance occurs which threatens to be in the nature of a revolution. Some few active minds take up an idea which has been brought into prominence by the peculiarities of some one or more professors of the particular art, and carry on a vigorous crusade on behalf of a view which, to judge from their professions and actions, they think destined to create a revolution. The leading ideas may not be—and, indeed, generally are not—new, but are in the nature of a revival, conscious or unconscious of something which has before been practised to a certain extent, but has been allowed to fall into neglect and so much of oblivion as to give a character of novelty when put forward with energy and some freshness of expression. Within living memory such attempts at upheaval have occurred in the fields of

* Read at the Photographic Convention.

poetry, of music, and at least twice in that of pictorial art, without leaving much permanent effect on the general appreciation of what are to be considered as the highest and most valuable qualities in the respective fields of labour involved.

It could scarcely be expected that photography should be exempt from disturbances of a character similar to those referred to as affecting other arts, and, in fact, there has recently been a revival in a very aggressive manner of a claim for superiority in results, differing mainly from those which have been accepted as representing the best work in photography in the indistinctness characterising them in whole or in part. The renewal in question is, doubtless, very largely due to the energetic advocacy of Dr. Emerson, and, although he has renounced what he had written in that connection, some of those who adopted his suggestions and supported his arguments still maintain the superiority of that photographic work in which indistinctness is the most promising characteristic, and do so with an aggressiveness and an assumption of artistic excellence that seems likely to induce a good deal of acquiescence, especially amongst the newer and less experienced amateurs, who are only too likely to be persuaded that the dimness and indistinctness which are so easy for them to produce, are something more artistic than the class of work with which they would find it harder to compete. These loudly asserted claims of artistic superiority seem, too, to have induced a certain amount of acquiescence among a larger class, photographers often submitting too readily to what claims to be artistically authoritative. It is not easy otherwise to account for medals being awarded to photographs which, independent of the question of indistinctness, one might have expected to be debarred by heavy artificial printing down of skies, a printing down which, in some cases, involves the confusion of such objects as would in nature, in painting, and in simple true photographs, stand out in decided relief against the aerial background.

The claim to artistic superiority for "soft" over "sharp" photographs depends, as has been previously pointed out, very much upon the different meaning attached to the word "sharp" by painters and by photographers, the latter understanding the word to mean minutely defined, and the former harsh in outline. Softness and thorough sharpness, in the photographic sense of fine definition, are quite compatible in a photograph in which, by extreme care in exposure and development, and, when necessary, by the use of orthochromatic methods, the gradations are properly rendered. It is, no doubt, easier to obtain a fictitious kind of softness by losing definition, but to claim a monopoly of artistic merit for this kind of softness seems to be about as reasonable as it would be to do so for those productions of the brush in which the badger softener had been freely employed by the painter.

As an example of the assumption of the monopoly of artistic merit by the professors of the indistinct school, and of the unworthiness of those who do not share in their views, may be mentioned the remarks of Mr. Maskell at the Camera Club Conference on the paper by Mr. Pennell. The last-named writer had condemned photography as false in representation, and as a hindrance rather than as a help to art; and Mr. Maskell replied to the effect that he could assent to these charges if applied to photography as practised until quite recently, but that some of the productions of the last two or three years—naming those workers who belong to the same school of indistinctness that he does—were of so different and superior a character that Mr. Pennell's criticisms were no longer justified. This assumption was more irritating than Mr. Pennell's easily refutable statements as to the inaccuracy of photographic perspective and other condemnations of our art. So, then, works such as those of England, Gale, Wilson, Robinson, Frith, Valentine, Bedford, Abney, Pringle, and hosts of others, English and foreign, are all to be rejected as fit for the denunciations heaped upon photography by Mr. Pennell, and only those of the circle to which Mr. Maskell belongs are useful to the draughtsman or worthy of anything but condemnation.

Then, again, Mr. Davison, at his lecture on "Impressionism in Photography," at the Society of Arts, spoke of those who had smirched photography by taking photographs sharp all over, and printing them on albumenised paper. That is to say, that those who have been recognised as the ablest workers are set down as having "smirched" photography by producing works in which the details and gradation of tone visible in the natural scene are, as far as practicable, reproduced in the picture.

With regard to the true rendering of gradation or tone, it may be remembered that Dr. Emerson particularly insisted upon preserving it as far as possible with the photographic means available. In this point he was at one with Abney and others, and I understand it to be the one point in his teaching which he did not renounce. By such devices as sunning the whole of the print—tending to indistinctness of another kind than that resulting from want of focus—and insisting upon matt surface, and even upon rough-surface paper for printing upon, the range of gradation, already insufficient in photography, is weakened, and truthfulness of representation to some extent sacrificed. An out-of-focus photograph, printed on rough paper, may suggest an unfinished sketch by a painter, but is not on that account really entitled to be called artistic, however loudly such a quality may be claimed for it.

Concerning such an essentially artificial (not the same thing as artistic) practice as sunning a photograph all over, Mr. Davison says (*Photography*, April 3, 1891): "It struck us at the last Pall Mall Exhibition that nine-tenths of the photographs collected there would have been less objectionable for a judicious sunning down, even if applied all over the prints." To set down nine-tenths of the work of one's co-exhibitors as "objectionable," from one cause alone, seems to me to be characteristic of that assumption of superiority by the professors of the cult of indistinctness, to protest against which is the object of the present paper. The remedy or palliative treatment prescribed will probably strike most people, besides the producers of this condemned nine-tenths of the work, as being itself objectionable.

Pretensions to artistic superiority are not necessarily justified in proportion to the dogmatic way in which they may be put forward. Gloom, mist, and indistinctness do not exhaust the beauties of nature, and are not its only phases worthy of representation, although in photography they may be the easiest to suggest, whether existing in the original subject or not.

---

MESSRS. PERCY LUND AND CO., of Bradford, have been clever enough to find out a use for spoilt negative glasses. They are supplying, in boxes, at a cheap rate, "Vista" mounts for different sized plates. These consist of cut-out mounts in ornamental paper, which, by an ingenious device, form elegant frames for photographs when attached to, or merely placed behind, the cleaned negative glass. There are twelve mounts in the half-plate boxes, and twenty in the quarter-plate boxes, and amateur photographers were so quick to note their advantages that upwards of one thousand were sold directly they were introduced.

# Patent Intelligence.

### Applications for Letters Patent.

11,434. David Allan, 157, Whitfield Street, St. Pancras, London, "Improvements in Portable Photographic Dark Room Developing Lamps."—July 6th.

11,575. James Philip Ottaway, 53, Chancery Lane, London, "An Improvement in Axle Caps for Vehicles."—July 7th.

11,578. Charles Henry Guest, 45, Tower Road, Birmingham, "An Improvement in Roll-Holders for Photographic Cameras."—July 8th.

11,588. Marquis Bibbero, Royal Polytechnic, Blackpool, Lancashire, "Au Improvement in a Lantern for the Reproduction of Opaque Substances."—July 8th.

11,728. Walter Edmund Kerslake and Peter White Johnson, 26, Castle Street, Liverpool, "Improvements in Apparatus for Changing Sensitised Plates for Photographic Cameras."—July 9th.

11,783. Marshall Arthur Weir, Fairview, Spring Grove, Kingston-on-Thames, "Improved Means for Backing Photographic Plates and Films."—July 11th, 1891.

### Specifications Published.

1,388. *January 27th*, 1890.—"Exposure Calculator." A. Watkins, Imperial Flour Mills, Hereford.

This consists of an apparatus on the principle of the slide rule for calculating the time of exposure to be given to a photographic plate. The time is calculated by multiplying together four factors, representing the actinic force of the light, A, the sensitiveness of the plate, P, the colour of the object and its distauce from the lens, S, and the relation of the diaphragm of the lens to its focal length, D. For multiplying these factors six rings, *g*, *h*, *i*, *j*, *k*, *l*, are fitted on a tube, *a*, the outer rings, *g* aud *l*, being fixed to the ring, while the other four can be rotated upon it. The ring *g* is marked with a scale for A, the ring *h* for P, the ring *i* for S, the ring *j* for D, the *l* with a scale of seconds for time of exposure, or result of the calculation. Inside the tube is fixed an actinometer, consisting of a strip of sensitive paper, which is exposed till it attains a standard tint for determining the value of A. The time for the apparatus is measured by a pendulum cousisting of the cap of tube suspended by a chain. In a modified form discs are used instead of riugs.

1,394. *January 27th*, 1890.—"Levels for Cameras, &c." G. J. Heaton, 2, Coburg Villas, Albert Road, Wiudsor.

Within a metal pillar, preferably square in section, is fitted a glass tube, a fixed rod, and a movable rod, which latter is suspended by a fibre of silk, &c. Wheu the iustrument is in a true vertical position, the two rods are in line. In a modification which is adapted for use in connection with photographic cameras, the glass tube is fitted with cups at the top and bottom, which are secured to a backing which is attached to the swing-back of the camera.

1,412. *January 27th*, 1890.—"Lamps." T. Bergmann, Eisenwerke Gaggenau, Gaggenau, Germany.

*Gas Lamps, Incandescent.*—The heating power of the flame is increased by supplying oxygen through a pipe to the ceutre of the gas-burner. Incandescent material is supported between two jaws, and can be adjusted relatively to the burner by a rack-and-pinion. Several of the burners may be used to form a cluster.

*Gas-Cocks.*—The cock has two passages for the passage of the gas and oxygen respectively. The relative proportions of the gas aud oxygen supplies can be regulated by set screws.

1,715. *February 1st*, 1890.—"Film-changing Apparatus." M. A. Wier, 9, Strand, London.

The camera may or may not be of the detective type, aud is fitted with a film-changing apparatus in the rear part of the dark chamber. One form of this apparatus is shown. The films, which are furnished with backings of uon-actinic paper attached to one edge, or separate backings of cardboard, are contained iu a box. After exposure, the front film is raised by a frame till the upper edge is caught between a band and roller, and is carried round aud deposited at the back of box as the band is wound off the spring roller on to another roller. The plates are pressed forward into focus by a screw, and the exposed plates are separated from the unexposed by a movable partition. When a separate opaque backing is used between the films, it may be used as a focussing screen before it is transferred to the back. Several modified forms of the change-box are described. Two rollers may be employed to increase the distance the plate is carried back, and the frame and push may be worked automatically from the transferring mechanism instead of separately by hand as in the case described.

1,791. *February 3rd*, 1890.—"Advertising and Magic Lanterns." A. Champness, 1, Stockfield Road, Tulse Hill, Surrey.

Advertisements are reflected on water, such as the sea, streams, &c., or on vapour, or the clouds, by a magic lantern as represented. Stencil slides may be used.

2,023. *February 7th*, 1890.—"Photographic Camera for Enlarging." W. Griffiths, Highgate Square, Birmingham.

*Enlarging.*—The body of the enlarging camera is made of metal, millboard, or other suitable material. A frame for carrying the negative fits telescopically in one end of the camera box; in the other end is fitted a dark slide having a plate of clear glass fitted in it to support the sensitive plate or film, and also for focussing purposes. The focussing screen is formed by pressing a piece of ground glass against the surface of the clear glass, this, after focussing, being removed for the insertion of the sensitive plate or film. The enlarging lens is fitted in a central frame or partition which, for focussing purposes, is fitted so as to slide telescopically in the camera box.

2,034. *February 7th*, 1890.—"Combined Tripod and Walking Stick." A. G. Rider, 11, Jewry Street, Winchester, Hants.

Each leg of the tripod is cut through for about one-third of its length, so that it can spring open to fit on the tripod top. The lower third of the leg is made to turn on a pivot, so that it can be extended or folded up. When the pivoted sectiou is extended, it is held in positiou by a notch on one end, which is slipped on to a fixed stud. When the legs are folded up and fitted with ferrules, they form a walking stick.

# Proceedings of Societies.

### Holborn Camera Club.

At last Friday's meeting of the Holborn Camera Club, Mr. T. O. Dear in the chair, Mr. E. Clifton gave a few hints on the method of finishing the negative. He had fonnd that amateurs took a great deal more trouble in developing their negatives than professionals, but in fixing and washing they reduced the careful developing to *nil*. While the print was in the fixing bath they would look at it every now and again and admire; the air, acting upon the silver, caused the film to turn a sickly yellow, and the result was flat negatives. Speaking of the final washing, he said a negative not thoroughly washed was very liable to damp, to say nothing of fading and kindred evils. He finished his hints by some remarks on reducing and iutensifying.

An interesting discussion followed, chiefly on reducing and packing of exposed plates ou a tour.

### North Middlesex Photographic Society.

*July 13th.*—Mr. H. Smith in the chair. This being the opening night of the new session, the meeting partook somewhat of the nature of a conversazioue. Objects of iuterest were passed round for inspection. The new patteru Thornton-Pickard aud the automatic time and instantaneous shutters were shown and thoroughly discussed. Cameras were shown by Mr. Braine and Mr. Gill. An ingenious printing frame to be used in combiuatiou printing, or for makiug lautern slides by contact from selected portions of a larger negative, was shown by the president.

The usual competition of views taken at the Society's field-days was then held; Mr. H. Smith received the vote of merit for views taken at Endfield and High Beech, and printed on "Celerotype" paper.

The president, Mr. J. W. Marchant, then addressed the members, pressing upon them not to hoard up knowledge, but to impart it freely to each other, and upon those beginning the study of photography to make known their difficulties, and to ask for information.

Four new members were elected.

---

Sydenham Camera Club.

*July 7th.*—The President in the chair.

A paper on "Home Portraiture" was read by Mr. J. Goldfinch, in which some valuable suggestions were given as to the lighting of the subject. He mentioned that a plaster bust was a very good object to try effects of lighting on, as it could be placed in whatever position wished, without tiring the sitter. He also went fully into various dodges to be resorted to in default of a studio, described the lens and camera, the best plates and developers to use, backgrounds, &c.

---

Hackney Photographic Society.

*July 9th.*—Mr. Beckett in the chair.

Mr. B. Foulkes Winks read a paper on the "Details of Silver Printing," going through all its stages from sensitising the paper to the mounting of the finished print.

Saturday, July 11th, was a hand-camera day down the river.

---

Sheffield Photographic Society.

*July 7th.*—Mr. B. J. Taylor in the chair.

After routine business, Mr. T. J. Hibbert brought for inspection the automatic hand-camera by G. Houghton & Son, fitted with one of Wray's lenses. Several members brought copies of prints taken at the recent excursion to Lincoln. Mr. E. Beck then gave a practical demonstration on "Platinotype Printing" by the hot-bath process.

It was arranged to have Saturday afternoon excursions as heretofore.

---

Oxford Photographic Society.

On July 7th the new rooms of this Society were opened, and will remain open each day, except Sundays, from 10 a.m. till about 9 p.m., for the members' use. There are already numerous photographic papers and books on the table, and it is hoped that the walls will soon be covered with photographs.

It is requested that all communications for the Society be addressed to the Hon. Secretaries, Photographic Society, 136, High Street, Oxford.

---

Photographic Club.—Subject for July 22nd, "Salting and Sensitising Photographic Papers"; 29th, "Developing en route." Outing on 18th at Welwyn; train from Moorgate Street at 2.15.

Phosphorescence of Minerals.—Various forms of fluorspar from various sources were excited by light, heat, and the electric spark, and the spectrum of the phosphorescence was examined. Measurements of the wave-lengths of the bands are given. In the phosphoroscope, the bands that are visible or have the highest intensity vary with the speed of rotation of the disc, a result due, according to the author, to differences in the persistence of the phosphorescence of the various substances that are present in the fluorspar, and give rise to the different spectra. The electric spark excites phosphorescence in the same way as sunlight, and the spectra are the same. The effect is more intense with the spark than with sunlight, probably because of the high proportion of rays of high refrangibility in the former. When fluorspar is heated, a limited quantity of energy is set free in the form of luminous vibrations, but if the heating is continued the phosphorescence ceases. It can, however, be restored by exposing the substance to light or the electric spark. The bands in the spectrum, when the substance is heated, have the same positions as in the phosphoroscope, but they have different relative intensities. The relative intensities also vary with the temperature. Phosphorescence under the influence of heat belongs, in fact, to the same class of phenomena as phosphorescence excited by light.—*Compt. Rend.*

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

C. A.—*Question of Copyright.* In the case which you put to us, the wholesale piracy of a series of copyright portraits in the manner indicated is clearly not lawful; but it might be possible to arrange for the assignment on easy terms, for your special purpose, of the copyright of the individual photographs composing your group, particularly as they would have to be reproduced on a much smaller scale. But the fact remains that a *copy of any size* is held to be an infringement of the owner's rights. The law of the case is clearly defined in Mr. C. Fleetwood Pritchard's article on page 87 of the Year-Book.

F. D. T. (Edinburgh).—*Collodio-Chloride Emulsion.* The cellular structure of your collodion films possibly arises from the circumstance of their containing too much extraneous salt—the by-product of double decomposition, sodium nitrate, &c. To overcome this defect, it would be advisable to emulsify a ready-formed chloride, or wash the emulsion as practised in the case of gelatino-bromide. The use of a highly glazed enamelled paper might enable you to succeed even with your existing preparations, but the other course is preferable.

O. C. (Bournemouth).—*Litho Presses.* We are sending you the address of a London firm from whom they can be procured.

L. R. C. (Whitchurch).—*Photo. Enamels.* Messrs. Sharpus, McCullum, and Co., of Cockspur Street, Charing Cross, will supply them.

St. Mungo.—*Silver Residues.* Salt will precipitate the silver from print washings; but all the waste hypo solutions should be mixed together and treated with *hepar sulphuris* until all the silver is thrown down as sulphide; best done on the roof or out of doors. Collect on a filter and send to the refiner, or reduce it by fusion with carbonate and nitrate of soda.

H. B. G.—*Sulphuration of Prints by India-rubber.* The practice of laying vulcanised rubber against the surface of silver prints, wet or dry, is not to be recommended, for the least trace of sulphur or sulphides is apt to cause a dark stain, as it will do even in the case of silver coin. The advice given in the printed account (keeping prints flat) is very good, with exception of this one particular.

Bradford.—*Oldfield's Multi-Colour Apparatus.* The specimen sent out with the prospectus is satisfactory, and reference is made to Patent Specification No. 9,302, A.D. 1889, from which you can doubtless gather further particulars. The invention has, however, nothing to do with chromo-photography, unless you can establish such a connection.

M. W. (Colchester).—*Photo-Training.* Spotting and mounting, book-keeping or reception-room duties, and even printing, is sometimes undertaken by ladies. You might offer to give time in return for instruction in these branches, and, when competent, you can of course submit your qualifications by advertisement. Second letter received.

C. N. & Co.—*Yellow Marks in Printing.* The most fertile source of such defects as those shown in your print is the injudicious handling of the paper in the early stages by fingers contaminated with hypo. We do not think they are due to bubbles or matting in the fixing bath.

F. I. C.—*Some Recent Advances in Photography.* The lecture recently given by Mr. C. H. Bothamley at the meeting of the Nottingham Section of the Society of Chemical Industry is reported in the current number of the official *Journal.* It deals chiefly with the primuline, Feertype, and kallitype processes, and their latest modifications.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV.—No. 1716.—*July* 24, 1891.


CONTENTS.



## HOW GAS CYLINDERS ARE MADE.

The supply of compressed gas in metal cylinders has now assumed the proportions of an important industry, more especially since it was found possible, by the Brin process, to obtain oxygen direct from the atmosphere. The industry is not exactly a new one, for carbon dioxide and nitrous oxide (the latter for the use of dentists) have been supplied in a compressed state for many years. Now, with the creation of the modern amateur photographer who can make lantern slides, and the more general adoption of the optical lantern for purposes of demonstration and amusement, there has arisen a demand for the limelight such as was never experienced before, and as the limelight is dependent upon the two gases hydrogen and oxygen for its support, these gases are now supplied in large quantities commercially. At first the gas cylinders were made of wrought iron; they were cumbrous and heavy, and the pressure of the enclosed gas was so low that a receptacle to hold only ten feet was a most unwieldy concern. But times have changed, and a cylinder of about the same size, but half the weight, is now made to hold four times the quantity of gas at the enormous initial pressure of 1,800 pounds on every square inch. This means the pressure which an ordinary locomotive boiler has to withstand multiplied by twelve. The change is due to improved methods of manufacture, and to the employment of mild steel of special quality in lieu of the wrought iron previously employed. The cylinders are now made without joint or seam, and the process of manufacture is most interesting. A short time ago we had an opportunity of watching the various necessary

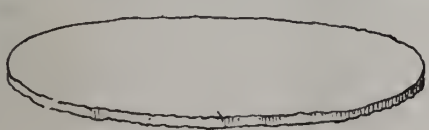


*Fig.* 1.

operations involved in making these cylinders at the Birmingham works of Messrs. Taunton, Delamard, and Co., by whose courtesy we were enabled to make notes of the process.

Beginning with the raw material, we were shown a disc of metal like that shown in fig. 1, and measuring thirty inches in diameter and three-quarters of an inch in thickness. From such a "blank" a cylinder destined to hold 100 feet of compressed gas can be constructed, and the first operation is to heat the "blank" in a furnace, and afterwards to stamp it into the cup-like form shown in fig. 2. To all intents and purposes this represents the end of a finished cylinder, but it is far too bulky to form the end of one of the size indicated; indeed, it in reality contains enough metal to make the entire vessel. By a series of operations it is now heated and drawn out longer and longer, while its thickness diminishes and its diameter grows less. These operations are carried out by means of a number of hydraulic rams which regularly decrease in size. Fig. 3 roughly represents one of these rams with the plunger ready to descend and force its way into the partially formed red-hot gas cylinder, C, and further into the well, W. The plunger may be compared to a finger, and the cylinder to a glove, while the well may represent a hole into which both are thrust in order to reduce the thickness of the glove. With huge tongs the cylinder, fresh from the furnace, is placed in position, but just before the plunger presses into the red-hot cup one of the workmen empties into the latter a little water, so as to partially cool the bottom and prevent it being thrust out by the powerful plunger. Oil is also used plentifully, so

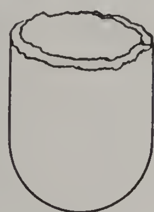


*Fig.* 2.


*Fig.* 3.

that as the plunger works slowly down the red-hot mass, it is surrounded by smoky flames. It presently forces the cylinder into the well, and when the end of the stroke is reached, a stop piece is inserted through an opening in the upper part of the well, so as to arrest the edge of the cylinder while the reverse action of drawing out the plunger is proceeded with. Directly the finger is drawn out of the glove—in other words, immediately the plunger is raised out of the cylinder—the latter drops down below with a heavy thud, still in a red-hot condition.

This operation of hot drawing is repeated again and again in rams of diminishing size until the cylinder assumes the diameter and length required. This hot drawing leaves the surface of the metal marked with longitudinal lines, not unlike the glacier scratches on a rock, albeit they are straighter and more regular. But the next operation not only obliterates these markings, and gives the metal a smooth surface like that of polished silver, but it also confers upon the material a homogeniety which it did not before possess, and without which it would never bear the pressure which it is destined to withstand when finished. This operation consists in a final application of the hydraulic ram while the metal remains perfectly cold, instead of red-hot as in the previous cases.

As a result of these various hydraulic operations, we have a perfectly formed cylinder closed at one end, and we now follow it into another department of the works, when its open end is once more brought in a furnace to a red heat. The object of this is to make the metal soft while the shoulder and neck of the vessel are formed.

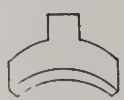


*Fig. 4.*

To accomplish this, the heated open end of the cylinder is laid horizontally upon a kind of semi-circular cradle, and is held there by tongs handled by two men. Another workman places over the open end a die of the form shown in fig. 4, and while the cylinder is slowly turned round in its cradle, two sledge hammers are brought down with frequent blows upon the die, closing in the end of the cylinder, but leaving a central hole as shown in fig. 5. Further operations reduce the opening

*Fig. 5.*

*Fig. 6.*

still more until it is closed altogether, and a projection is formed as shown at fig. 6. This projection is now bored through, and the cylinder is ready for testing.

The cylinder is submitted to a water test, the liquid being forced in until the gauge shows a pressure of two tons to the square inch. Cylinders have been known to give way under this ordeal, but without any dangerous consequences. The metal simply rips up, making a report at the moment of fracture as loud as a gun. The wonderful strength of the metal employed may be gauged by the circumstance that the walls of the cylinder designed to hold 100 feet of gas are only $\frac{5}{16}$ of an inch in thickness.

During the manufacture of the cylinder, as we have already indicated, much oil is used, and, so far as steel can be saturated with that fluid—in the popular sense—the metal is in that state. It is essential that this oil should be completely got rid of, and this is carefully done before the cylinder is charged with gas. Previous to such charging, the vessel has to be fitted with its valve. Of these valves there are three kinds, known respectively as the Brin, the Birmingham, and the Manchester. Each has its admirers, but we cannot here discuss their individual merits.

The charging of the cylinder is brought about by a powerful pump having three cylinders so arranged that the compressed contents of the first cylinder are still further compressed in the second, and still more highly in the third. The filling of a 100-ft. cylinder occupies about half-an-hour.

## THE "OPTIMUS" WORKS.

By the above title the workshops of Messrs. Perken, Son, and Rayment may fairly be called, for "Optimus" is their well-known trade-mark, and it is evident to the most casual visitor that they make every possible effort to turn out "the best" work. Such a visit did we pay to this enterprising firm a week back, and we saw much that was interesting, and work which involves the patient fashioning from the raw materials of such delicate instruments as cameras, lenses, optical lanterns, and all the multifarious things which are constructed for the aid of the modern photographer, cannot fail to be of interest to the spectator.

The premises occupied by this firm are very extensive, and comprise a series of workshops fitted with every appliance for cabinet making, at Saffron Hill, and the main building at Hatton Garden, where the lenses are ground, and where various other operations are carried on with a large staff of workmen. Visiting first of all the cabinet works at Saffron Hill, we are shown, stored in the lower part of the premises, a large stock of wood, which, however, represents only that required for present needs. On the second floor are cutters, vertical and horizontal, circular saws, and planing machines. It is here that the various parts of the cameras and wooden bodies of the lanterns are cut out—one can hardly say in the rough, for everything is done to guage, and the fine grooves, the rebates, and other shapes are cut to the greatest nicety, and far more accurately than they could be done by hand tools.

The making of a camera is no longer, as it was twenty years ago, such a simple affair that any carpenter can turn one out. In those days, one box sliding within another with something like accuracy, and a screw to hold them together, was all that was either looked for or required. Rising fronts, swing-backs, leather bellows, rack-work, and all the other niceties of the present machine were undreamt of. But now that the camera has grown from this primitive form into what may be described as a delicately adjusted philosophical instrument, a different race of workers has become necessary for its manufacture. With the old workmen have been discarded many of the old tools, and, indeed, it would be difficult, if not impossible, to make a modern camera with the old appliances. A new system has, in fact, come into vogue with the introduction of the revolving cutter, which can be set to cut grooves of any width or depth with an accuracy formerly unknown. The same principle is seen in the planing maching, when a slab of rough wood passed beneath a roller comes out at the other side with a smooth surface showing all the beautiful figure and grain of the material. All these aids to camera construction, with others too numerous to mention, are seen in this busy workshop.

In an adjoining department we find the French-polishers at work, each man having before him piles of unfinished bodies of cameras, and working upon each in turn, for good polishing requires that the wood should be left for a time between the various stages, so that the spirit in the polish shall partly evaporate, or that the ground layer shall have time to sufficiently soak into the wood before it is farther worked upon.

Proceeding to the floor above, we find that wood has given place to metal, for here about a dozen lathes are at work turning out such parts of the metal work of cameras and lanterns as can be fashioned in the lathe. These would, of course, comprehend the mounts of lenses, from those intended for 12-inch condensers for enlarging lanterns, to the humble quarter-plate size so dear to beginners. Here also we see a brass rack-cutting machine, and various other appliances for saving labour. All the metal fittings of cameras are made here, from the solid turntable to the smallest hinge—the cameras ranging in size from 36 by 30 (used principally by photo-mechanical workers) to the handy detective, of which favourite type we are shown many varieties.

Repairing now to the main building in Hatton Garden, we are taken first to the lens-grinding department, where we watch the various operations, from grinding and shaping with coarse emery, to the final delicate polishing. We also see how the component parts of a lens are joined together—never to be divorced—by a drop of viscid Canada balsam, and, after a baking operation, are carefully tested to see that the two glasses are central with one another. Here, too, we see how the diaphragms are made, and carefully cut to gauge.

We next visit the tin-workers' shop, not a very busy department at this season, for here lantern bodies and linings are chiefly made, and the time for such things does not set in until the fall of the year. There is machinery here of the most ingenious design—and far too elaborate to be described in the limits of a short article—for stamping, cutting, and bending sheet metal.

Before leaving the premises, we have a glance at the noble array of cameras displayed in the principal showroom. All sizes up to 15 by 12 are kept in stock; but it is found inexpedient to make larger ones except to order, for persons giving such orders have generally special ideas to be carried out, which might not commend themselves to all purchasers. We notice a new form of enlarging apparatus here with double bellows, the condenser situated midway. This arrangement saves woodwork and space. Each bellows is fitted with the patent focussing screw peculiar to this firm, which can be thrown out of action by pressure, and with which all the best cameras manufactured by Messrs. Perken, Son, and Rayment are fitted.

---

CLEVELAND CAMERA CLUB.—We are advised that Mr. Joseph J. Hallam has been appointed honorary secretary to the above Club.

## THE PHOTOGRAPHIC WORK OF HERSCHEL AND FOX TALBOT.*

BY WILLIAM LANG, JUN., F.C.S.

THE fourth division of the paper is occupied with what the author calls the chemical analysis of the solar spectrum. It would be beyond the limits of this communication to go further into all the experiments and speculations recorded in this classical memoir. The paper occupies sixty pages of the printed Transactions of the Royal Society, and it may be regarded as the foundation stone on which subsequent researches and experiments have been reared. One of the Society's medals was awarded to the author for this contribution to science.

The eleventh meeting of the British Association was held at Plymouth in July, 1841. Herschel, on that occasion, addressed a letter to the Physical Section accompanied by fifteen specimens of coloured photographic copies of engravings and mezzotints, "the whole" (as the writer puts it) "being tinted with substances of vegetable origin, variously prepared."

In the following year, viz., 1842, another memoir was presented to the Royal Society, "On the Action of the Rays of the Solar Spectrum on Vegetable Colours, and on some new Photographic Processes." Although appearing in the Philosophical Transactions as one contribution, there were originally three papers read before the Royal Society, the respective dates of which were June 16th and November 17th and 24th. The memoir is a continuation of the one given in 1840. Elaborate experiments with gum guiacium and expressed juices of flowers are first given in detail, and these are followed by others where the salts of iron have their reactions studied, the outcome of which we have in the two photographic processes known as chrysotype and cyanotype. Briefly stated, the first-named consists in coating paper with a solution of ammonia-citrate of iron, exposing to light, and afterwards developing with a solution of gold chloride. Some specimens thus prepared are here by way of illustration. The fixing of chrysotype was effected by means of potassium iodide. The reduced iron compound can also be rendered apparent by means of a solution of silver nitrate. A print thus produced is here for inspection. Cyanotype is perhaps better known to most of us as the blue process. In this method, development is effected by means of a solution of potassium ferricyanide, red prussiate of potash. The memoir closes with some experiments bearing on the photographic properties of mercury.

In these early years of the photographic art the *Athenæum* was in the habit of reporting matters appertaining to photography. In consequence of some discrepancies in the account given by this paper of the foregoing discoveries, we find a letter from Herschel making the necessary corrections. The letter, dated 10th August, 1842, appears in No. 773, p. 748, of the *Athenæum*.

Professor Draper, of New York, having, towards the end of the year 1842, presented Herschel with a Daguerreotype impression of the solar spectrum, the latter, in acknowledging its receipt, contributes to the *Philosophical Magazine* an article entitled "Action of the Rays of the Solar Spectrum on the Daguerreotype Plate." From it we learn that Herschel had himself been experimenting in securing spectrum impressions on Daguerreotype plates, and, although he admits that his manipulation was not all that could be desired, still his results were such that

* Continued from page 510.

comparisons could be instituted between Draper's plate and his own. The whole tenor of the paper is philosophical, and occupies twelve pages of volume xxii. of the journal already referred to.

At the Cork meeting of the British Association in August, 1843, a paper was communicated by Herschel: "Notice of a remarkable Photographic Process by which Dormant Pictures are produced capable of Development by the Breath, or by keeping in a Moist Atmosphere."

In the Philosophical Transactions for 1843 we find another memoir contributed to the Royal Society: "On Certain Improvements in Photographic Processes described in a former communication, and on the Parathermic Rays of the Solar Spectrum." This communication was made on 24th November, and is, in effect, a continuation of the two former memoirs, the numbering of the paragraphs running continuously throughout.

At the York meeting of the British Association, held in September, 1844, Herschel announced a new photographic process, to which he gave the name of amphitype, a term suggested by Talbot, in consequence of the picture, according to the method adopted in the subsequent manipulations, becoming either a positive or a negative reproduction. It may be here remarked that Herschel, in all these experiments, seems to have used engravings instead of the ordinary negative. Herschel, from his researches, had realised the fact that silver bromide was more sensitive to light, or, rather, that it was affected by a wider range of the rays forming the solar spectrum, than silver iodide, which formed the staple of Calotype, and afterwards that of the collodion process. Accordingly, when the Photographic Society of London was formed, in 1853, among the first contributions to its transactions we find one from Herschel, "On the Substitution of Bromine for Iodine in Photographic Processes." This paper was read 2nd June, and I may be allowed to quote one pregnant sentence from it, which may almost be regarded as prophetic—"A new photography has to be created, of which bromine is the basis." In 1855 Herschel advocated the desirability of securing daily photographic representations of the sun. The original communication was read before the Astronomical Society, and will be found in the volume for 1854-55 of the monthly notices of the Society. It is also to be found reported in the *Athenæum*, in No. 1,435.

In 1858, at the Leeds meeting of the British Association, Herschel presided over section B, the chemical, and his introductory remarks, so far as they relate to our own science of photography, may be appropriately quoted. The words used by Herschel in 1858 are no less significant in our own day:—

"Hitherto the more attractive applications of photography have had too much the effect of distracting the attention from the purely chemical question which it raises, but the more we consider them in the abstract, the more strongly they force themselves on our notice, and I look forward to their occupying a much larger space in the domain of chemical enquiry than is the case at present."

The same sentiment regarding photography has been otherwise expressed by Major Russell, who is credited with having said that photography would be a most interesting subject were it not for the pictures.

In 1859 an article from Herschel appeared in the second volume of the Photographic News, in the number for July 22nd, "The Action of the Solar Spectrum upon Certain Compounds of Silver," and in the third volume of the same paper, in the number for September 9th, under the same title, a further communication is to be found. This article has an accompanying illustration of the apparatus employed by the author in securing his spectra impressions.

In the Photographic News of May 11th, 1860 (Vol. IV.), Herschel contributes an article, "Instantaneous Photography." He discusses the possibility of taking a rapid series of pictures of moving objects, and recombining them in the optical apparatus, the phenakistiscope. The appearance of motion is again imparted to the eye when the pictures are rapidly revolved. This method, as you are all aware, has been adopted by Muybridge. A term is used by Herschel in this communication which, although common enough now-a-days, is very significant, and describes well the taking of an instantaneous picture. I refer to the term snap-shot. I make the statement subject, of course, to correction, but I think we may give to Herschel the credit of coining this photographic term for us equally with the better known terms of positive and negative.

In 1861, in the eighth volume, p. 384, of the *British Journal of Photography*, Herschel contributes an article, "Forms of Lenses suited for Destroying Spherical Aberration."

The foregoing represents an epitome of the work done by Herschel. We will now consider Talbot's share in the development of our art.

Talbot's experimental photographic work appears to have been begun about the year 1834. By means of paper impregnated with silver chloride, Talbot asserts that he had secured camera pictures of his residence as early as 1835 (*vide* appendix to second addition of "Tissandier's Photography," written by Talbot). It was not, however, till January 25th, 1839, at one of the Friday meetings of the Royal Institution, that the process was first publicly announced, and as Faraday, who brought the matter forward, explained, it was done so for the purpose of "establishing a date." Daguerre's process had been announced in January, but the particulars were only known to his friend Arago. Talbot had in the meantime sent in a paper to the Royal Society, and he was afraid that Daguerre's process might be divulged before his communication to the Royal Society was published. On the Thursday following, however—viz., the 31st January, 1839—Talbot's paper, entitled "Some Account of the Art of Photographic Drawing; or, the Process by which Natural Objects may be made to Delineate themselves without the aid of the Artist's Pencil," was read. The paper was not published in the "Philosophical Transactions," but an abstract of it is given in the "Proceedings of the Royal Society," vol. iv., p. 120. It was printed *in extenso* in the *London and Edinburgh Philosophical Magazine*, March, 1839, vol. xiv., p. 209. Both at the Royal Institution meeting, and that of the Royal Society, specimens of "photogenic drawing" were exhibited, along with the camera pictures of Talbot's residence. On the 21st Feb., 1839, a paper, entitled "An Account of the Processes Employed in Photogenic Drawing," was communicated to the Royal Society. The memoir divides itself into two parts, first the preparation of the paper, and secondly the fixing of the design, which was effected by a solution of potassium iodide of the proper strength, or by a strong solution of sodium chloride. Talbot at this stage was doing little more than producing negative designs from opaque natural objects.

*(To be continued.)*

## AFFILIATION OF SOCIETIES.

The following circular has been issued by the Parent Society:—

50, *Great Russell Street, Bloomsbury, London, W.C.*

Dear Sir,—A general desire has for some time been expressed that some closer union of the photographic societies of the United Kingdom should be brought about for the better promotion of their common interests.

Taking this into consideration, a committee was appointed by the Photographic Society of Great Britain to examine the question and report upon it. By direction of the Council, a copy of this report I have now the honour to enclose you herewith.

Will you kindly bring the report, together with this letter, to the notice of your members on an early opportunity, in order to elicit their views upon the subject, and then let me know the result.—Yours truly, A. M. Mantell, Capt. R.E., *Hon. Sec.*

### Affiliation.

*Preliminary.*

On the 11th November last, a circular respecting the foundation of a photographic institute was approved of at the meeting of the Photographic Society of Great Britain, and at the next meeting was ordered to be forwarded to the photographic societies in Great Britain.

Replies from fourteen societies were received, and the whole question has been further considered by the council of the Photographic Society of Great Britain.

In the meantime, an independent scheme of federation was drafted, and invitations were sent to the London societies to send delegates to a meeting, at which the subject was to be discussed.

Some of the London societies nominated delegates, and a committee was selected to draft a scheme, which was done, but from the first there seemed a strong feeling in favour of the initiative being taken by the Photographic Society of Great Britain.

This committee of delegates, at its last meeting, dissolved itself, but with a renewed expression of opinion that the Photographic Society of Great Britain should definitely take up the question of affiliation, and an endeavour was made by the delegates present to pledge two members of the council of the Photographic Society of Great Britain, who were informally at the meeting, to take action in this direction.

The committee of the council of the Photographic Society of Great Britain appointed to consider the matter have constantly had the whole question before them, and, in view of these decided expressions of opinion, a preliminary report was submitted to the Society at the meeting on April 13th, which has since appeared in the photographic journals.

This report was of a tentative nature, intended to elicit the opinions of those interested.

The result has been a concensus of opinion that a closer union of photographic societies is desirable, and that the Photographic Society of Great Britain should take the lead in effecting it. Under these circumstances, the committee, which at first consisted of Sir H. T. Wood, Mr. Leon Warnerke, and Mr. G. L. Addenbrooke, was, by resolution of the council, further strengthened by the addition of Mr. W. Bedford, Dr. G. Lindsay Johnson, Mr. W. E. Debenham, and Mr. A. Cowan.

These gentlemen, having given the matter their careful consideration, have embodied their ideas in the following report:—

*Report of Affiliation Committee.*

*June 9th*, 1891.

Although it is now clear that there is no immediate prospect of carrying out the whole of the objects originally included in the scheme of the Photographic Institute, yet some of the advantages which the Institute was intended to confer on photographers could be secured by a scheme of affiliation to the Photographic Society of Great Britain, and this without any great expenditure either of time or funds, by utilising the machinery and facilities at the disposal of the Photographic Society of Great Britain.

As this matter concerns the advancement of photography and the benefit of photographers generally, the committee recommend that the Photographic Society of Great Britain should allow its rooms to be used as a centre, and should arrange the office work necessary for a federation of societies, as the secretaries of the Society occupy a position to conduct with advantage the correspondence and negotiations by which a system of affiliation may be established and worked. A subscription from affiliated societies, &c., will be necessary to cover the cost of clerical labour, postage, office expenses, &c., involved, and as a contribution towards publishing the Society's Journal, which would be supplied to affiliated societies, and would thus become the organ of the affiliation, in addition to its present purpose.

Affiliation would be by the Council of the Photographic Society of Great Britain. All affiliated Societies would have a voice in the management. Delegates appointed by the Societies should meet in London not less than once a year to determine the lines of action, and would appoint a permanent sub-committee to supervise affiliation work for the next year, and to carry out resolutions passed by the assembled delegates.

It is undesirable to hamper the initial stages of affiliation by too strict definitions or restrictions. As the movement is of a novel character it may be expected to develop itself in the best way as it goes along. As a preliminary step, however, the following prospectus has been drafted, which, with a copy of this report, it is proposed should be sent to all photographic societies to invite co-operation and support.

*Scheme of Affiliation.*

The object of affiliating all photographic societies is to promote co-operation with one another and with the Photographic Society of Great Britain for the advancement of photography, and for the promotion of mutual interests. The following desirable objects of attainment may be enumerated:—

1. Assisting societies in obtaining and interchanging lectures, papers, lantern slides, examples of good work, &c.
2. Facilitating the holding of local exhibitions.
3. Arranging for the provision and exchange of dark rooms for the use of members in local centres.
4. Extending the applications of photography to industrial purposes, and in such directions as local surveys, photographing and preserving photographs of ancient buildings, and architectural and archæological records.
5. Assisting scientific research in photography and kindred sciences.
6. Assisting the Photographic Society of Great Britain in its endeavour to promote photographic technical education.
7. Co-operating with the Photographic Society of Great Britain in securing a universal adoption of photographic standards for lenses, screws, size of plates, formulæ, &c.

To carry out these objects efficiently a united effort on the part of existing societies is essential.

The assistant-secretary of the Photographic Society of Great Britain, who will co-operate in carrying out this scheme, will be in attendance at the rooms of the Photographic Society of Great Britain every week-day (with certain exceptions to be arranged later on) from 2·0 to 9·30 p.m., and may be consulted by members of affiliated societies, and will also reply to any communications which may be addressed to him by the secretaries and members of affiliated societies.

The secretary will try to bring societies desiring lectures on particular subjects into direct communication with persons willing to lecture, and will be glad to receive, either as a loan or as a gift, interesting lantern slides, which may remain at his disposal, either permanently or for a time, so that they may be lent to Societies holding lantern exhibitions.

It is suggested that prize pictures and examples of processes might be collected, which would be at the disposal of societies and circulated amongst them, so that all members might have a chance of seeing examples of the best work from time to time; and this, it is hoped, would help to raise the standard of photographic work generally.

It is to be expected that affiliation will strengthen the Parent Society and the affiliated branches alike, to the advantage of photographic science and art ; to contribute to this common end, the Photographic Society of Great Britain offers to the members of the affiliated societies the following advantages :—

1. The use of its rooms and offices, 50, Great Russell Street, W.C., for the meetings of delegates forming the affiliation committee, and for the meetings of the sub-committee it may appoint.
2. The services of the assistant-secretary, and the provision of stationery, postage, &c., for the conduct of federal affairs.
3. Admission of members of all affiliated societies to courses of technical lectures, which the Photographic Society of Great Britain hopes to organise, at half the charges made to non-members.
4. The use of the dark room at 50, Great Russell Street, W.C., by affiliated members upon payment of a small charge for the use of chemicals.
5. Affiliated societies will be supplied with two transferable season tickets for the Society's annual exhibition.
6. Two copies of the "Journal and Transactions" will be supplied to each affiliated society.

The general rules now suggested are few and simple, but may serve as a basis for an approved code.

General Rules.

Affiliation shall be by the council of the Photographic Society of Great Britain.

All societies shall be eligible, whether London, Provincial, Colonial, or Foreign.

Each affiliated society shall be entitled to appoint a delegate, who, in conjunction with a certain number of members to be appointed by the Photographic Society of Great Britain, shall form the affiliation committee, with the right to vote in all matters in which the committee may deal.

The affiliation committee shall have power to nominate certain of their number to supervise and carry on the work of affiliation on such general lines as may meet the approval of the council of the Photographic Society of Great Britain.

The affiliation committee shall have power to make such laws as may be required for conducting the different branches of affiliation work.

The votes of the affiliation committee may be taken in writing on any important subjects which require decision between the annual meetings.

The annual subscription shall be one guinea, payable on election, in advance, on January 1st in every year. Any society whose subscription may be three months overdue shall cease to be a member of the affiliation, but may be reinstated by the council on satisfactory explanation and payment of arrears.

## SOME NEW ADDITION COMPOUNDS OF "THIOCARBAMIDE" WHICH AFFORD EVIDENCE OF ITS CONSTITUTION.*

BY J. EMERSON REYNOLDS, M.D., F.R.S., PROFESSOR OF CHEMISTRY, UNIVERSITY OF DUBLIN.

*Methyl and Ethyl-Ammonium Salts and Thiocarbamide.*—The general results of the experiments in this direction were unexpected, as it was found that methylammonium salts combine with thiocarbamide, but those of ethylammonium do *not* under any conditions yet realised. I shall first describe the experiments which led to the definite combination.

Three grams of pure methylammonium bromide were dissolved in the smallest possible quantity of strong alcohol, and added to a boiling alcoholic solution of 7·8 grams of thiocarbamide. Combination took place on continued heating, and the solution when cooled became nearly solid, owing to the separation of a felted crystalline mass very similar in appearance to that afforded by ammonium bromide and the amide under similar conditions. This product was pressed, washed, and recrystallised, and when so purified was found to melt sharply at 138°, or 35° lower than the melting point of the ammonium bromide compound (173—174°).

On analysis, it afforded the following results :—

0·427 gram gave 0·1915 AgBr.
0·3897 „ „ 0·8642 $BaSO_4$.

The compound is, therefore, $(H_4N_2CS)_4(CH_3)H_3NBr$, which requires—

| | Theory. | Found. |
|---|---|---|
| S ... ... | 30·76 per cent. ... | 30·48 per cent. |
| Br ... ... | 19·23 „ ... | 19·08 „ |

Methylammonium chloride gave a similar compound with thiocarbamide, but it was not examined in detail.

Experiments with ethylammonium salts led to negative results so far as direct union with thiocarbamide is concerned. Ethylamine from various sources was used in the preparation of the salts, and the conditions were varied to a much greater extent than in the previous experiments, but without effect.

As long continued heating to the boiling point of absolute alcohol under atmospheric pressure did not determine combination, 2·5 grams of the pure bromide and 6 grams of thiocarbamide were sealed up in a tube with sufficient alcohol to dissolve the whole at 70°. The tube and its contents were then heated at 110° for two hours, but on cooling no evidence of combination was obtained. The heating was repeated for three hours, but the temperature was maintained at about 135°. On cooling, the contents of the tube now became nearly solid, and the mass resembled the ammonium bromide compound in appearance. When the solid contents were twice recrystallised from alcohol, the product was found to contain bromine and sulphur, and it melted at 175—176°, or very slightly higher than the ammonium bromide compound which it so closely resembled in appearance, and on analysis it proved to be that body.

0·2056 gram gave 0·098 AgBr.
0·2732 „ „ 0 1285 $H_2O$ and 0·1245 $CO_2$.

| | Theory for $NH_4Br$ compound. | Theory for $NEtH_3Br$ compound. | Found. |
|---|---|---|---|
| Br ... ... | 19·98 p. c. | 18·60 p. c. | 20·28 p. c. |
| C ... ... | 11·99 „ | 16·76 „ | 12·42 „ |
| H ... ... | 4·96 „ | 5·58 „ | 5·22 „ |

The determination of carbon was made because of the wide difference in percentages of that element.

There is no doubt, then, that ethylammonium bromide and 4 mols. of thiocarbamide do not directly unite when heated with alcohol at 135°, but rather afford the ammonium bromide compound, with ethyl oxide as a necessary bye-product, according to the equation $4H_4N_2CS + N(CH_5)H_3Br + C_2H_5{\cdot}OH = (H_4N_2CS)_4NH_4Br + (C_2H_5)_2O$.

Summary of the Facts.

It has been shown that—

1. Thiocarbamide combines with ammonium bromide, iodide, and chloride at the temperature of boiling alcohol, and forms characteristic compounds of the type $(H_4N_2CS)_4H_4NR'$. But no compounds could be formed under the conditions specified which contained *less* than four molecular proportions of the amide to one of the ammonium haloïd salt.

2. The following mono- and di-substituted thiocarbamides failed to afford any compounds with ammonium

* Continued from page 509.

bromide at the temperature of boiling alcohol, viz.: methyl-, ethyl-, allyl-, phenyl-, diphenyl-, and acetyl-phenyl-thiocarbamides.

3. Thiocarbamide combines with tetrethylammonium bromide and iodide, and forms well-defined crystalline compounds of the type $(H_4N_2CS)_2Et_4NR'$. But no well-defined substance could be isolated under any of the experimental conditions containing more than 2 mols. of the amide and 1 mol. of the tetrethylammonium salt.

4. Thiocarbamide combines with diethylammonium bromide, and the well-crystallised compound $(H_4N_2CS)_3Et_2H_2NBr$ was separated. If a tetra-compound be formed in solution, it is certainly broken up on slow crystallisation.

5. Thiocarbamide also unites with triethylammonium bromide, and in presence of excess of amide a somewhat felted mass is obtained, which on recrystallisation affords two distinct crystals, namely, $(H_4N_2CS)_3Et_3HNBr$ and $(H_4N_2CS)_2Et_3HNBr$.

6. With methylammonium bromide, thiocarbamide afforded the compound $(H_4N_2CS)_4MeH_3NBr$, which resembles the corresponding ammonium bromide compound in appearance, but melts at a temperature 34° lower. On the other hand, with *ethyl*ammonium bromide no combination whatever could be effected, and when 4 : 1 mols. of the amide and salt were heated in a pressure tube with alcohol at 135°, ethyl oxide and *tetrathiocarbamidammonium bromide* were the products.

*Bearing of the Results on the Question of the Constitution of Thiocarbamide.*

Unless thiocarbamide is held to be a tautomeric substance, its constitution may be represented by either of the following formulæ, viz:—

α-Symmetrical ... .. ... ... $CS{<}^{NH_2}_{NH_2}$

β-Unsymmetrical ... ... ... $HN{:}C{<}^{NH_2}_{SH}$

Of late the evidence in favour of the latter constitution has been considerably strengthened, more especially by the careful work of Mr. Emil A. Werner carried on in my laboratory (see Trans., 1890, 57, 283). I shall now proceed to show that the facts recorded in the present paper supply evidence of a new kind, and altogether in favour of the β or unsymmetrical structure—at least under the conditions of my experiments.

The readiness with which ammonium bromide, iodide, and chloride form tolerably stable *tetra*thiocarbamide compounds—and only these—is evidently connected with the number of atoms of hydrogen in the ammonium haloïd, that is, with the valency of its nitrogen. This necessarily involves the idea of something in the nature of substitution. Moreover, the tendency to form complete and comparatively simple compounds of the order in question must be strong, since we have seen that ethyl is displaced by hydrogen when ethylammonium bromide and 4 mols. of thiocarbamide are heated to 135°, the stable ammonium bromide compound being then formed.

The fact that *none* of the mono- or di-substituted thiocarbamides combine with ammonium bromide under the usual conditions goes far to prove that neither the carbon nor sulphur of thiocarbamide are concerned in the linkage with the ammonium haloïd. It is admitted that alkylic or other radicles of substituted thiocarbamides of the types used are directly united with nitrogen; there is, therefore, no reason why the carbon or sulphur of the primary should be materially affected by such substitution. And further, in regard to sulphur, neither the di- nor tri-ethylammonium bromide compounds formed with thiocarbamide afforded mercaptan or alkylic sulphide, or their products, when heated to 100° with alkalis and alkaline lead solution, in these particulars differing materially from the action of addition compounds of thiocarbamides of the sulphine class.

On the other hand, the loss of power of combination with ammonium bromide when but one atom of hydrogen in thiocarbamide is displaced by a more positive radicle, such as ethyl or phenyl, is inconsistent with the symmetrical constitution of thiocarbamide, which should still have an $NH_2$ group unaffected and available for union; but is quite consistent with its unsymmetrical structure.* In the latter case, the two nitrogen atoms are differently engaged, and the genesis of a monosubstituted thiocarbamide from R·N:CS, and ammonia, points to the structure $R{\cdot}N{:}C{<}^{NH_2}_{SH}$ rather than $\dot{H}N{:}C{<}^{NHR}_{SH}$ for the product. Now the fact that combination takes place with facility between thiocarbamide and ammonium bromide, but not at all with ethyl- or phenyl-thiocarbamide, accords with the structure $RN{:}C{<}^{NH_2}_{SH}$, where the presence of the positive radicle in the imidic group paralyses the power of combination, which appears in consequence to be exclusively due to the NH of the substance we have been accustomed to term thio-carbamide. The ammonium bromide compound would therefore become $[NH_2(SH)CNH_2]_4NBr$; but whether union is effected by breaking the double linkage of carbon and NH, or the change of valency of the latter, remains for determination.

In the ammonium bromide compound, the attraction of the components seems to be at a maximum; but whilst substitution in thiocarbamide reduces it to zero, similar substitution in ammonium bromide (save in the case of the ethylammonium salt†) only lessens the power of forming tetra-compounds without destroying it. These facts seem to point to the development of quinquavalence in one of the nitrogen atoms of thiocarbamide in the course of combination.

I think the true "thiocarbamide" is yet to be discovered, and that we must revert to the name "sulphurea" or "thiourea" as the correct designation of the primary substance from which the above compounds have been obtained.

## BRUSSELS EXHIBITION.

THE following is a list of the awards to the British exhibitors at the Brussels Exhibition:—

Grand Diploma of Honour to J. Pattison Gibson, Hexham.

Silver gilt medals to F. P. Cembrano, Richmond; Lyd. Sawyer, Newcastle-on-Tyne; Col. Waterhouse, Calcutta; Walter Colls, and Window and Grove, London.

Silver medals to Wilson and Son, Aberdeen; Werner and Son, Dublin; W. Clement Williams, Halifax.

Bronze medals to J. Carpenter, London; J. Martin Harding, Shrewsbury; Morgan and Kidd, London; W. Winter, Derby; York and Sons, London; J. Luders, Cape Town; J. W. Ross, Cape Town; A. Hendrey, Godmanchester.

* From a somewhat similar point of view, the production of a tetra- rather than a di-thiocarbamide compound is inconsistent with the symmetrical structure.

† Whose non-combination may be more apparent than real if formed and decomposed at nearly the same temperature level.

## Notes.

Anglo-Indian photographers have lately been protesting in print against the prohibitive prices charged by local dealers. But it is easy to see that this protest would never have seen the light if there were not something still more serious to complain of. The dealers, it is said, are in the habit of supplying stale materials, so that a photographer who may have been at extraordinary pains to secure a picture at a distance from home will often find, on development, that the plate he has confidently used is good for nothing.

It is rather difficult to suggest a remedy for this state of things, unless it be that plates should be specially made for India, and packed under special precautions. This, of course, could not be done unless the amount of trade with India were much greater than it is at present. Or a plate factory might be established in India by some enterprising maker. Anyone who has had experience of gelatine plate making will know what uphill work this would mean in a climate such as that of India. Even in our own more temperate summer, plate-makers, as a rule, confine the work to the cool and early hours of the morning. In India it would probably be necessary to coat the plates in a refrigerating chamber, such as that common on ship board for the preservation of meat. The degree of cold required need only be sufficient to ensure the setting of the gelatine, and such a temperature could be secured at very little expense.

In order to prevent accident from admixture of the two gases hydrogen and oxygen, which, as everyone now knows, form such a terribly explosive compound, it has long been the custom in this country to paint hydrogen cylinders red, and oxygen cylinders black, and, as a further precaution, the hydrogen cylinder has a screw nozzle with a left-hand thread. It has lately been pointed out that in America the oxygen cylinders are painted red, and the hydrogen black, thus reversing the system customary on this side of the Atlantic. It is quite conceivable that accident might arise from American cylinders finding their way over here, or *vice versa*, and it would be far better that we should agree upon some uniform manner of marking them. The inconvenience and expense entailed in making a change would naturally be resisted by either nation, and we suppose that matters must remain as they are, in spite of the manifest risk.

At the forthcoming National Eisteddfod of Wales, which will be held at Swansea next month, there will be several competitions in the Arts and Miscellaneous Section. The committee have given notice that they have decided to make certain subjects in the section "open competitions" —that is to say, they will not be confined to Welshmen. These competitions include painting, carving and sculpture, and photography. The adjudicators are all well-known men, and intending competitors in photography will know that they are in good hands when they learn that Mr. J. Traill Taylor is to adjudicate upon the works sent in.

Photographers who wish to secure pictures of the Upper Thames without much trouble or exertion to themselves may be reminded that Messrs. Salter, the well-known Oxford boat-builders, are running two well-appointed steam launches, which daily ply between Oxford and Kingston. The trip either way occupies two days, and beautiful Henley is the half-way house where travellers rest for the night.

The seizure in London of a number of photographs of pictures in the Salon raises an old question which we suppose will be always hotly debated so long as Mrs. Grundy exercises her present influence over what is supposed to be English taste. One can understand a Vigilance Society, imbued with Mr. Horsley's opinions on the subject of the nude, objecting to certain pictures; it is when it begins to argue that issue must be joined. For this reason Mr. W. A. Coote, secretary of the National Vigilance Association, would have been wiser had he refrained from offering any comments on the subject. However, he has chosen to unburden himself, and we cannot say we are sorry, as he has succeeded in planting himself on ground as debateable as anyone could wish.

For instance, he actually asserts that the photograph of a picture may be objectionable, though the picture itself may not be. These objectionable qualities, he says, are introduced into the copy by "the eccentricities of the photographer's art." Mr. Coote, it seems, sees only indecency when a picture is robbed of its colour and reproduced in black-and-white. This would be very terrible if it were not very stupid, and we should very much like to see Mr. Coote justify his position—if he can. At present it looks as if he is bent upon making this self-appointed Vigilance Association a laughing-stock—a position, by the way, it has already occupied more than once.

One of the most useful items of photographic intelligence which always comes fresh to the non-photographic press is the intimation that the latest fashionable "fad" is for ladies to have their hands and feet photographed. This piece of news has been dished up over and over again for the last three years, and once more came up smiling last week in the pages of a provincial journal. It is really time some photographer came forward and verified the existence of this "fad." For ourselves, we take leave to doubt the whole business, and we do so for the reason that the notion that ladies should have their hands and feet photographed first saw the light in these columns, the suggestion naturally growing out of the craze for palmistry, which was then at its height. Still, we should be willing to record the experience of any photographer, even if he has only had one foot submitted to him.

Mr. Edison has been anticipated in his kinetograph by a Mr. Hartman, who has invented what he calls a "zotograph," which fulfils the same functions as Mr. Edison's apparatus, and was made before Mr. Edison applied for a patent. It is said that the zotograph will see everything which comes within its range, and record the same automatically and correctly. Placed in a car window, it will photograph everything as it goes along. It will also record the babel of sounds as they pass by. It will record even the slightest progressive movement of a horse in its complete race round the track. Hartman claims to fix motions on the sensitive plate at the rate of 50 to 100 per second; Edison does not undertake to record more than 46.

## EARLY BANK-NOTE FORGERIES—A PAGE OF HISTORY.

BY JOHN SPILLER, F.C.S.

The interesting article on "Photographic Fraud," by Mr. James Mew, which appeared in the News of 29th May (page 401), recalls to my mind some experiments made nearly thirty years ago conjointly with a firm of paper makers and bank-note engravers, which resulted in the detection of a photographic fraud that was being practised at that time upon the Bank of Spain. In December, 1861, a couple of Doscientos notes of the Banco de Espana were brought to me at the Royal Arsenal, one of which was stated to be genuine, and the other was believed to be a forgery possibly effected by photographic means. I was requested to try and find out the way in which the latter had been produced; and my opinion was further asked respecting the correctness of a certain certificate given by an expert, which document, after setting forth critically the chief points of physical difference between the true and spurious notes, concluded with the following remark:—"We are not aware of anything more to add except that the imitation has not been effected by photography."

Mere inspection did not at once disclose any very perceptible difference. There was, perhaps, a little want of definition in the geometrical design printed on the body of the forged note, but only such as might readily escape notice in a specimen which had either been a long time in circulation, or become dingy by wear. On comparing the notes superposed, and examining them by transmitted light, there appeared, however, to be a slight difference in dimensions, so that it was inferred that they had *not* been printed from the same engraved plate, although the measurements of the paper absolutely coincided. Such, then, was the problem submitted to me, and I set to work to apply chemical tests. First, by burning small portions of the notes, it was found that the true ink was entirely consumed, whereas the ash left by the spurious note was still legible, *and contained both gold and silver.* Now, by reversing the mode of attack, and soaking the notes—or pieces of them—in cyanide of potassium, the true note resisted well for a long time, whilst the piracy soon cleared up to a fragment of plain paper, as would happen in the event of its being a gold-toned photograph. Here, again, silver and gold were detected in solution. The notes were ornamented with an elaborate green device and red border, which behaved differently when treated with acids, the spurious paper giving up its colours immediately, and the other only after the lapse of a longer time. The numbering of the notes was done alike with printing ink, and the paper was well imitated.

Although the facts were brought to light and reported to my friends before the end of the year 1861, I am not aware that the source of the forgery was ever traced and brought home to the guilty parties; so that it may well happen that the conviction of 1863, mentioned by Mr. Mew in connection with the Austrian Bank, was actually the first prosecution undertaken against a photographic forger, although it would still be untrue to say, as asserted, that it was "the first attempt to forge bank-notes by photographic aid," the Spanish case, proved up to the hilt, and known to certain parties in this country, being evidence to the contrary. However, it is doubtful whether the facts ever came to be widely known either in England or Spain, a policy of silence being usually observed under such circumstances.

Since the invention of the collotype and photo-engraving processes, the nature of the ink might be practically identical with that employed by the authorised bank-note printers, and so new difficulties would be introduced. Now comes in the further advantage of perfecting the system of non-actinic overlays, whereby it would become impossible to secure a photographic counterfeit of the original engraved plate; but to do this, one requires to find a substance of the requisite photo-opacity, which in itself is unattacked by all the ordinary chemical solvents, and yet be possessed of the transparent qualities fitting it for application on the face of a bank-note. Few solid pigments satisfy this requirement, and colours which are opaque give but an indifferent artistic effect. There is room for further experiment in this direction, account being taken of the extraordinary facilities offered to the piratical copyist by the use of isochromatic plates, and reward awaits the successful operator.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Intensifying Process by Double Printing—Paramidophenol Developer—Chloro-Cyanin as a Sensitiser for Red.

*The Process of Intensifying which has been employed in the work, "Who is Rembrandt?" by the Author of it.*—Herr Max Lautner, the author of that remarkable book, "Who is Rembrandt?"—in which, as I mentioned on a previous occasion, it is demonstrated by photographic reproductions that on many of the magnificent paintings attributed hitherto to Rembrandt the name of this latter has been falsified, and that they are in reality the works of Ferdinand Bol—has just published in Liesegang's *Photogr. Archiv* the method of intensifying which he has employed in reproducing the falsified monograms. The author states that, in order to increase the contrasts of the tones in the photographic reproductions as much as possible, it was necessary to make use of a special intensifying method—one giving a much more powerful intensification than the various processes generally in use for similar purposes. This new method—if it is altogether a new one—consists in the following:—Two negatives of exactly the same size are made from the subject, one of them being reversed as if it be destined for collotype. If a transparent film—for instance, an Eastman gelatino-bromide film, which can be printed from both sides—is used for the reproduction, the process is much simplified, a single negative being then sufficient. For printing, gelatino-chloride paper is used which has been made transparent previously by treating it with paraffin or with benzole. To prevent the evaporation of these volatile oils during printing, the paper is covered with a transparent gelatine paper—as it is used for counter-drawing—which has been treated with a chrome alum solution in order to render it more flexible and resistant. As the oil evaporates entirely after printing, it does not at all affect the subsequent toning, fixing, and washing processes. A mode of double printing, which forms the base of the entire process, is now effected by exposing the gelatino-chloride paper at first from the back beneath the negative, then from the front or film side. During the second printing it is, of course, absolutely necessary that the print produced by the first exposure and the negative are exactly in register. It will be evident that by this method prints are obtained of unusually powerful contrasts, the lights of the positive image turning out perfectly white, whilst the shadows—if only two tones are taken into consideration—have acquired double the depth or intensity in relation to the lights.

*Paramidophenol Developer.* — This new developer, introduced by Messrs. Lumière, has now been tried also by our German authorities, and their judgments are, on the whole, favourable to this reducing agent. Professor Vogel finds that the pure paramidophenol is very insoluble, so that it was impossible to prepare with it the solution recommended by Messrs. Lumière. Dr. Schuchardt, of Görlitz, has, however, succeeded in producing an hydrochloric preparation of this substance which, in the hands of Prof. Vogel, proved to be more soluble than the first one, though it is said to dissolve much less readily in cold water than hydroquinone. It is, therefore, necessary to heat the water previously. The developer thus obtained is very energetic, giving, however, somewhat thin negatives, and the mixed solution soon becomes brown. If the paramidophenol solution and the sodium sulphite solution are kept separately, they will keep clear. Also Prof. Eder and E. Valenta state that the paramidophenol forms an excellent developer, giving, according to its composition, every degree of softness or intensity. The colour of the negatives is greyish-black, the film being free of every bluish or greenish colour, even if a neutral fixing bath is used. The authors recommend the use of a dilute solution, for the reason that then the paramidophenol does not crystallise out of its solution, and the developer becomes less expensive. Moreover, the diluted solutions form equally excellent developers as the concentrated ones. The formulæ recommended by the authors are the following:—

*Paramidophenol-Soda Developer.*

| | | |
|---|---|---|
| Water ... ... ... ... ... | 1,000 | c.c. |
| Sodium sulphite ... ... ... | 80 | grammes |
| Carbonate of soda ... ... ... | 40 | ,, |
| Paramidophenol ... ... ... | 4 | ,, |

*Paramidophenol-Potash Developer.*

| | | |
|---|---|---|
| Water ... ... ... ... ... | 1,000 | c.c. |
| Sodium sulphite ... ... ... | 120 | grammes |
| Carbonate of potash ... ... ... | 40 | ,, |
| Paramidophenol ... ... ... | 4 | ,, |

The latter is specially well suited for plates which tend to give thin negatives, whilst the soda developer yields more delicate images. With the latter, also, transparencies on gelatino-bromide emulsion may be developed very successfully.

*Chloro-Cyanin as a Red Sensitiser.*—Cyanin, which has been introduced in photographic practice by V. Schumann, forms, besides chlorophyl, the best sensitiser for red and orange. Professor Eder, in the *Photogr. Correspondenz*, points out that all commercial cyanin is the so-called iodo-cyanin, by the use of which fog is produced sometimes during developing. He recommends, therefore, to convert the iodo-cyanin into the analogous chloro-cyanin, which latter is said to show less tendency to the formation of fog. This conversion may be easily effected in the following manner:—The cyanin is powdered, placed in a porcelain or platinum dish, and some water and hydrochloric acid poured over it. It is then evaporated in a water-bath (with constant stirring) to dryness, the residuum being again wetted with hydrochloric acid, and then once more evaporated in the water-bath. There remains behind, with evolution of hydric iodide, a residuum of chloro-cyanin, which still contains traces of hydrochloric acid, and is not, therefore, entirely blue. The last traces of hydrochloric acid will, however, escape by heating the dish carefully on a sand-bath until the edges of the film of cyanin become dark. If the dish has been previously weighed, the increased weight will give the amount of chloro-cyanin which it contains after evaporation, which may be dissolved in a corresponding quantity of alcohol.

## RECENT DEVELOPMENTS IN PRINTING PROCESSES.*

BY C. H. BOTHAMLEY, F.C.S.

The permanence of the kallitype images is of considerable interest. The black images by both the first and second method are not altered by exposure for forty-eight hours to the products of the combustion of sulphur in air, nor by immersion in a solution of sulphurous acid for the same length of time. A solution of sulphuretted hydrogen, if dilute, changes the colour to bluish black, but produces no other alteration; if the solution is strong, the bluish black image undergoes a further change, and becomes brown. A dilute solution of ammonium sulphide changes the colour to brown, with no loss of detail and not much loss of intensity; the brown colour thus produced is very suitable to certain subjects.

The sepia paper, likewise, seems unaffected by the products of the combustion of sulphur; sulphuretted hydrogen or ammonium sulphide first changes the sepia image to black, but it afterwards becomes gradually brown.

No prolonged experiments on the behaviour of mounted prints have as yet been possible, but there is no reason to doubt that, under ordinary conditions, kallitype prints are permanent. It is, of course, not to be expected that kallitype can as yet equal platinotype, but it is by no means improbable that in time the difference will be chiefly a possible difference in permanency. The process is already capable of giving very good results, and it is considerably cheaper than platinotype.

The other processes that I shall describe belong to an entirely different class; they are the first practicable photographic processes based on the use of coal-tar colours. Both processes depend on the formation of azo colouring matters from diazo compounds, and they may be spoken of as diazotype, but they differ in the nature of the change that the light produces, and in the condition under which the colouring matter is formed.

Diazo compounds are a class of compounds characterised by their power of uniting with carbolic acid or any other phenol, any naphthol, or any amine to form an azo-colouring matter, the tint of which depends on the nature of the diazo compound, and also on the composition of the particular phenol, naphthol, or amine. Yellow, orange, brown, purple, scarlet, and blue may be cited as examples of the variety of colour that can be obtained in this way.

Feer-type is the first of these processes, and is so called from the inventor, Dr. Adolph Feer (German patent 53,455, December 5th, 1889). It is based on the fact that diazo compounds in contact with acid sulphites form diazo-sulphonic compounds, and these form no colouring matter. If, therefore, a diazo-sulphonic compound is mixed with an equivalent quantity of a phenol or an amine, no colouring matter is formed. If, however, the mixture is exposed to light the diazo-sulphonic compound is decomposed, the diazo compound is set free, and, since a phenol or amine is already present, a colouring matter is formed as fast as the diazo compound is liberated.

* Concluded from page 517.

The process is applicable both to paper and to textile fabrics. The paper or fabric is coated with a solution of a diazo-sulphonic compound of high molecular weight, mixed with an equivalent quantity of a phenol, or a naphthol and an alkali, or with an equivalent quantity of an amine and an acid. The patent specification recommends sodium ditolyltetrazo-sulphonate, but Feer has since recommended sodium diazopseudocumidine-sulphonate, which can be obtained from Dr. Schuchardt, of Görlitz. My own experiments, which are as yet but few in number, were made with this compound and β-naphthol. An exposure of ten seconds to comparatively weak sunlight produces a very decided quantity of colouring matter, and an exposure of a very few minutes gives a deep-coloured print. The rate of formation of the colouring matter decreases as the exposure continues, because the colouring matter formed in the superficial layer acts as a screen to the unaltered material behind. The light from burning magnesium will also produce a print, and prolonged exposure to gaslight will produce an easily recognisable amount of colouring matter. Some "nature prints" from fern leaves are exhibited; they show a very considerable amount of detail as well as the outline.

The primuline process is the second process of this class, and is the invention of Messrs. Green, Cross, and Bevan (English Patent 7,453, May 13th, 1890). Primuline was first made by Mr. Green, and is a yellow colouring matter that contains sulphur. It has the peculiar property of dyeing cotton, linen, paper, or any other material consisting of cellulose, without the use of a mordant. The exact constitution of primuline is not yet known, but it contains an amido group, and, therefore, will yield a diazo compound, which in its turn will form colouring matters. Diazo-primuline in the pure, solid state, is practically unaffected by even prolonged exposure to light, but when in contact with cotton, linen, or cellulose it is rapidly decomposed by light, with complete destruction of the diazo compound and consequent loss of the power to form colouring matters.

The primuline process is applicable to fabrics as well as to paper, and gives better results with the former. Herein, in fact, lies its special merit. Fine calico, linen, &c., free from grease, is immersed for a short time in a boiling solution of primuline (about 3 parts in 1,000) containing a small quantity of common salt, and is then washed with water. If necessary, it may at this stage be dried, and will keep for any length of time. In order to sensitise the material, the primuline is converted into diazo-primuline by immersion for a short time in a dilute solution of sodium or potassium nitrite (1 part in 400), acidified with hydrochloric, sulphuric, oxalic, or some other acid. It is then washed and dried in the dark without the aid of heat. If made too dry the material becomes less sensitive.

The sensitive material is exposed in an ordinary printing frame, a very short time being required in bright sunlight, but a much longer time in a dull light. Since the correct time of exposure cannot be judged by mere inspection, a strip of the same material is exposed outside the printing frame, and is touched from time to time with a drop of the developing solution. When the latter ceases to produce any colour, the diazo-primuline on the test strip is completely decomposed, and it may be taken that decomposition in the high-lights of the transparency is also complete. The print is then ready for development, which is effected by immersing the print in one of the following solutions:—For *yellow*, phenol; for *orange*, resorcinol; for *red*, β-naphthol; for *maroon*, β-naphthol-disulphonic acid. One part of the substance is dissolved in 400 parts of water, made alkaline with caustic potash or caustic soda. Other developers are: for *brown*, meta-phenylenediamine; for *purple*, alpha-naphthylamine; for *deep blue*, eikonogen. The eikonogen is dissolved simply in water; the two amines are dissolved in water acidified with hydrochloric acid. Different developers—stiffened, if necessary, with starch—may be applied with a brush to different parts of the same prints. The developed prints are washed with water, and, in the case of the blue and purple developers, the last wash water should be *slightly* acidified with tartaric acid. In the other cases the prints are improved by being washed with soap and water. In all cases the appearance of the print is improved if, after removal from the printing frame, the back of the print is exposed to light for a short time in order to secure complete decomposition of the diazo-primuline in the high-lights. The ground of the prints always remains pale yellow, and, at present, no method has been discovered by which a white ground can be obtained.

In Feer-type the quantity of colouring matter formed is proportional to the quantity of light action, and hence we obtain a positive from a negative, and *vice versâ*. In the primuline process the quantity of colouring matter is inversely proportional to the amount of light action, and hence we get a positive from a positive, and a negative from a negative.

The prints, being formed of azo-colouring matters, will gradually fade if exposed to sunlight, but are permanent enough if exposed only to the diffused light of ordinary rooms.

Neither of the diazotype processes is at all likely to displace any of the ordinary printing processes, but they may be specially useful for the copying of engineers' plans, &c., upon cloth, and, since a variety of colours can be obtained, the processes are likely to be very useful for decorative purposes. The primuline process is very simple and cleanly, and can be readily used by ladies, who, with the help of dried ferns and other leaves, can produce a great variety of designs on linen, &c., and these can be mounted in any desired manner. In this connection, it may be useful to point out that the disagreeable smell of the purple developer (alphanaphthylamine), which clings very tenaciously to the fingers, can be removed by dipping the fingers into the solution of nitrous acid used for sensitising the primuline.

## WHAT WASTES TO SAVE, AND HOW TO SAVE THEM.

What would the family photographer say to his wife if he knew that one-half of every barrel of flour he provided for his household was allowed to fall under foot, or to be burned in the stove as fuel? And yet we dare to say that one-half the photographers allow at least one-half of the precious metals they purchase for picture making to be wasted as wickedly as though its cost was no greater than that of common flour. One pound of silvered albumenised paper in good health—*i.e.*, when it is clean and free from nails and bits of tintype plates, cardboard, glass, or other dirt and solids—is worth from forty to fifty cents, according to the strength of the silver solution, the amount of salting in the paper, and the treatment of it. This value is somewhat reduced by the exposure of the sensitised paper to the light, for a part of the silver is thus rendered insoluble, and so recovery of all the silver is beyond the power of chemistry. Yet, after all, nearly sixty per cent. of the silver you purchase can be returned to you, and a goodly part of the gold, if you will carefully follow the directions given below.

A. *Developer Drippings.*—Enough protosulphate of iron remains in the drippings from the development of wet plates to precipitate the silver. What is needed, then, is to carefully catch what goes off the plate in a proper vessel, and allow it to settle. Pour off the clear water once a day. This last is important, for when the water is allowed to remain for some days the recovery of the silver becomes more difficult, and therefore the amount recovered is much lessened, owing to the large quantity of iron present. If left any length of time, then test with salt; if same show a precipitate, then proceed as follows:—A small quantity of salt in solution should be stirred into the drippings before the water is poured off, and until the water appears clear. Take time and do the work thoroughly. The precipitate is rich in chloride of silver. Add the salt gradually, stirring up the solution until it no longer forms a precipitate, which you may easily determine by taking a sample of it in a tumbler or white bottle, holding it up to the light when adding a little salt. Don't add too much, as an excess will redissolve the chloride. When the silver is all down, pour in a little acid, either nitric, sulphuric, or muriatic, which will clear the solution; allow it to stand for about twenty-four hours, then draw off your clear water and you have the chloride on the bottom of the vessel.

B. *Fixing Solutions* are very rich in silver. They should be precipitated with sulphuret of potassiums previously dissolved in water, also adding it as long as it will form a precipitate. The latter, when down, may be thrown on a plain muslin filter to allow the water to drain off. Such a filter may be readily constructed by taking a piece of common unbleached muslin, say a yard square, tying loops to the four corners, and hanging it up on sticks.

A good many photographers are in the habit of precipitating their washing solutions with metallic zinc suspended in sheets therein. The action of zinc, however, is slow, and must be accelerated by acidifying the solution. Now it frequently happens that the fixing solution is allowed to run into the same vessel, and the hypo, being an alkali, suspends the action of the zinc. In the course of time a deposit out of the water is formed, but the happy proprietors of the "mud" are sadly disappointed in its value, as it is sometimes even so poor as not to pay for the trouble of refining. All hypo fixing solutions may be treated together in this way. A large barrel serves as the best receptacle for them. Insert a spigot about six inches from the bottom. It has been found economical to use a large crock or stone jar—or it may be glass—for the negative fixing solution; you can use a dipper with it, or let a strong strip of glass remain in and across it at an angle to prevent the smaller plates from going flat to the bottom of the vessel. Once in a while the solution may be emptied into the barrel. The precipitate which results is sulphide of silver.

C. *Impure Solutions and Used Baths.*—Besides salt, muriatic acid, sulphuret of potassium, protosulphate of iron, or sheet copper may be used for the precipitation of silver from any solution very rich in silver; and they should be used, or else the solution boiled down to dryness, when the wastes are sent to the refiner. The reasons are obvious; the freight is less, and the danger of loss from the breakage of bottles and leakage is insured against. See instructions for saving print washings (E). The same course may be followed here.

D. *Silvered Paper.*—All prints should be trimmed before toning, as it saves gold, and besides, toned paper is of hardly any value. Keep the untoned clippings and filters clean, by themselves; do not throw sweepings, pieces of glass, and spoiled ferrotype plates among them, as their bulk only decreases the real value. If you wish to burn the paper, have your stove cleaned of cinders and ashes, and proceed slowly, for a good draught will carry many particles of silver through the flue. Every inch of silvered trimmings is valuable, and should be kept in a box separately. Do not tread them under foot and allow them to become mixed with dirt and grit and dust on the floor. Keep a cover on the box, and do not allow anything but clean, untoned paper trimmings to go into it. We prefer to burn the paper, but if you attempt it, see that every bit of the paper "cinders" is consumed before the ashes are taken from the stove.

E. *Print Washings* may be treated the same as A, only it is best to keep them separate. You save enough extra to more than pay you for the additional trouble. Add the salt gradually, and watch the effect. If precipitation is slow and the solution remains milky in appearance, the addition of a little of the protosulphate of iron solution is of good service. Some workers prefer a mixed solution of salt and alum—say twelve ounces of each ingredient dissolved in two quarts of hot water—for a stock solution. Add this carefully, and not too much of it.

F. *Toning Solutions.*—Precipitate these with protosulphate of iron, but be sure and have the solution "acid," as otherwise the iron will be precipitated, and your gold will be lost. Old toning baths, and the precipitates which form when the toning bath is being neutralised by bicarbonate of soda or other alkali, should all be saved, and separately from any other wastes.

G. *Toned Paper Clippings.*—In a small business it hardly pays to save these, but where quantities are large and fuel and time are cheap, it often does. Printers for the trade, publishers of photographs, and those whose business is large, have found the recovery of gold from these clippings well worth looking after.

H. *Old and Spoiled Dry Plates* are likewise worth taking care of. The emulsion from all such can be best removed by soaking them in a strong hot solution of carbonate of soda (washing soda). When a quantity is collected, strain it through a muslin filter, allowing the solution to drain off. A stone jar is excellent for this work. After filtration the precipitate should be allowed to dry spontaneously, after which it is ready for the refiner.

I. *Barrels, Floors, and Old Hats.*—We have likewise found that the wood of barrels which contained waste solutions for a number of years was quite impregnated with silver, some barrels yielding as many as thirty ounces of metal; so when yours are unfit for further use you know what to do with them.

The same discovery has been made as to the floors of long-used dark rooms and of rooms where the paper is silvered and drained and fixed. Old felt hats are used for developer drippings by some. These with the developer, skins, fragments, and emulsion from dry plates, as well as blotters and filters, are well worth saving.

J. *Aristotype Paper Wastes* should be treated the same as other paper wastes (D). They may go together, but in everything like "wastes" the separate plan is preferable.

K. *Finally, a word or two.*—The end of all waste is silver and gold, if you strive to follow our advice. Dissolve the salt and iron before they are added to the waste solutions. A few drops of acid should be added to the iron solution before it is used. Any acid added to a cyanide solution will precipitate the silver. Have abundant air in circulation about you when you do this, for the fumes—*waste you!* Don't use sheet zinc for anything hereof.

Last, but not least, do not send small lots of waste to be refined, but wait until you have a reasonable quantity, for expenses and charges are then comparatively less.—*St. Louis and Canadian Photographer.*

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

FRENCH PHOTOGRAPHIC SOCIETY — COLOURED LIQUID SCREENS—SHUTTER—NEW ROLL-HOLDER—DIRECT POSITIVES IN THE CAMERA—NEW CURTAIN SHUTTER—NEW ZINCOGRAPHIC PROCESS—SOCIETE D'ETUDES PHOTOGRAPHIQUE.

*Coloured Liquid Screens.*—M. Franck has introduced some new tanks formed of glasses with parallel sides, between which is injected a coloured liquid, this arrangement taking the place of the coloured screens commonly used. This communication recalls one having the same object which was put forward by M. Chouroude. It is evident that these tanks can render efficient service in connection with orthochromatic work, although one would prefer a solid preparation on glass or pellicle. We need not add to the complications of the work by introducing such manifestly awkward arrangements.

*New Shutter by M. Gillon.*—This contrivance is of metal, and it is placed between the two combinations of the lens. According to the inventor, it gives various speeds, from one of some minutes' duration, to the $\frac{1}{300}$th of a second. It is composed of three eccentric leaves which cross one another, and the opening between them is central.

*New Roll-Holder by M. Flauvel.*—This holder enables the operator to change the rollers in full sunlight upon which the film is carried. They are surrounded by several turns of a non-actinic material, an arrangement which has been suggested and adopted before. This holder, however, is very well designed.

*Direct Positives in the Camera.*—Col. Waterhouse's new method. This is a communication upon a subject which has already been well ventilated in the columns of the PHOTOGRAPHIC NEWS.

*New Curtain Shutter by Commandant Moessard.*—This inventor has produced a shutter on the curtain principle, which is placed in front of the negative plate in the camera, and which has an opening varying from one millimetre to two centimetres. It can be moved with great rapidity, and springs are employed to regulate its movements. But what is the use of such complications when other shutters are available which are so much more simple and convenient?

*Zincographic Process, by MM. Lumiere, Fils.*—We printed last week in the PHOTOGRAPHIC NEWS the full text of this interesting communication.

*Société d'Etudes Photographique.*—A new process for impressing lines on a metal plate has been brought forward by M. Parison. It consists in the employment of a hollow cylinder which has on its surface a series of small holes made in a straight line. Within the tube, or cylinder, is placed a source of light, and as the tube moves over a metal surface made sensitive to light, a line is produced by the light emitted from each hole. The arrangement is a somewhat complicated one, and is not likely to supersede better known methods.

## LIGHTING IN PORTRAITURE.

BY XANTHUS SMITH.

LIGHT and shadow is the soul of art. There is no higher expression of art than in fine sculpture; and as the beauty of form in sculpture is developed by light and shadow only, and as light and shadow is the sole mode of expression of photography, we may, I think, be permitted to use sculpture as a basis from which to draw our comparisons, and upon which to form our principles.

The sun, the great giver of light and of life, is also the great sculptor and painter. We poor mortals, admiring the infinite beauties which he constantly spreads before us, are ever in vain trying to imitate them. To our perceptions, when the sun is doing its great work it is ever above us; as it descends it becomes more feeble, till, as it passes beneath the horizon, its work is done, on our half of this sphere, for the day. The objects which constitute nature, to our perceptions, are never lighted from beneath. Has nature purposely so designed her infinite creations that they may appear the most interesting by this lighting from above? Or are we, through mere habit, so accustomed to it that we accept it as the right? We think we may safely hold that the former is far the more likely, as in both animal and vegetable growths we universally see the greatest beauties of conformation and colouring upturned, as if thus to receive to the best advantage the descending rays of the glorious sun.

In the human countenance and its portrayal to the best advantage, which forms the theme of our present writing, we have the finest example of the influence of light and shadow in developing properly nature's finest work, if we adhere to what she has evidently pointed out as her intention. Let us take the features separately. The forehead, the seat of the highest intellectural qualities—how can it be lighted to show its beautiful conformation but from above? Then the eyes and eyebrows—how else can we see their force and detail and brilliancy than by an upper lighting? Take a fine nose and place a light beneath it, and what can you make of it? Of the mouth, chin, and cheeks—nay, even the ear—can we say aught else than that when lighted from underneath their individual interest is lost, and their beauty destroyed in place of being developed? How, then, taken as a whole, can we make anything but what we may almost call an absurdity of a human head under a false lighting?

Nothing is more easily and plainly exemplified than the unpleasant effect of ill lighting. Let the handsomest member of any family favoured with average good looks—whether it be man or woman, old or young, it matters not—stand himself up at night, or in a darkened apartment, and let another member of the family take a good lamp and place it at any angle or in any position which he may choose with regard to the head and face of the individual posed, so that he always keep it below the level of the head; and let the other members of the family decide whether they would admire and value a picture of the one so seen under any of the varied aspects which he or she would present. I think we may safely say that in ninety-nine cases out of a hundred they would not.

The mode of studying the varied effects of light and shadow by a lamp placed in different positions with regard to the head and face is a very simple and excellent one. It is open to all who feel sufficiently interested in art to give a few minutes to it, and exemplifies the wonderful effects of light and shadow in either the making or marring of a good human countenance.

It may be objected that this mode of lighting is too strong and too exaggerated (and so it would be for refined countenances) to be photographed. Of course we must then have a softer and more diffused light; but the principle is precisely the same, whether it be a soft or a powerful light. It must fall from the proper direction.

From centuries past to the present day, and notwithstanding the various whims and freaks of fashion, which, arising from a vulgar rage for novelty, are constantly assailing all well-founded truths, it has been the custom in academies and schools of art, and in all galleries purposely constructed for the display of sculpture, to use a lighting that falls at an angle of forty-five degrees, or above, on the sculptures used as models to draw and paint from, and to be exhibited to the greatest advantage to intelligent people. What would we know of the solemn grandeur of the bust of Homer, or of the beauty of the head of the Apollo Belvidere, if we had never seen them properly lighted? How could we read the various characteristics of the Greek and Roman philosophers, statesmen, and rulers, as we do in the portrait sculptures that have come down to us, did we not have the power of casting a well-arranged lighting upon them?

The photographer may say, "What have we to do with Homers and Apollos and sculpture; are we not working from and catering to the flesh and blood of to-day?" But I say, Are we not men? Do we not furnish now as fine specimens of the human countenance as existed in the period of Greek art? Certainly. We have our great statesmen, generals, and philosophers, and alas! they are too often trusting to the camera alone for the perpetuation of their semblance. Possibly no mode can so truly convey to us as can the photographic art the actuality of a countenance. But we must never lose sight of the fact that that countenance, if it be the index to a mind worthy of perpetuation, must be portrayed under a lighting in conformity with the inscrutable laws of nature and of art.

We must beg to be pardoned if we speak strongly upon the importance of this matter of lighting in portraiture. During the past few days the subject has presented itself to us more forcibly than it probably has ever done before. One of our most distinguished citizens has just passed away. He stood amongst the few very highest in science of any time or country. Immediately we see large photographs of him placed in the windows of some of the photographers. They are splendid works as regards technique; but why should the noble face have been buried in shadow, a harsh line of light cutting down one edge only? Was it ignorance or thoughtlessness on the part of the person who posed this distinguished sitter? He surely had the means in his skylight of letting nature's illuminating rays fall broadly and truly upon this noble countenance, so that the grandeur and dignity which it possessed might have been perpetuated to us to their full extent and value. Those photographers who profess to do only a respectable business should pay more attention than they do to this all-important subject, and we would admonish those who are at the head of leading galleries, and whose duty it daily becomes to affix the images of our greatest men of the day, that they are doing wrong in not making a regular art study of their pursuit. They should secure a few fine casts from the antique, preferably portrait busts, and study them and photograph them under various lightings; see how they may be made to look dignified or mean, grave or ridiculous.

You will, no doubt, think it a very easy matter to talk, and especially for one who knows little or nothing about the practical business of running a photographic gallery. There is no one better acquainted with the difficulty of producing a very fine photographic likeness than the writer. It is something which he is constantly striving to do, yet never satisfying himself; and, moreover, he is thoroughly acquainted with the trials to be contended with in catering to an uncultivated public. Our ideas upon the subject of art portraiture could not be put universally in practice. Ignorance and fashion cannot be stormed and annihilated. The mind must be led; good comes about gradually.

What we would have is that the portrait photographer properly and conscientiously prepare himself, as an artist does, for the work that is to be his calling, so that whenever an opportunity occurs to get in some real, good, artistic work, he may do it. By artistic I do not mean what the whim of the day may call artistic, but artistic as founded upon the genuine high art of the past, and the rules of good taste and judgment that have stood the test of ages. Let him, when a distinguished man with a fine forehead comes along, secure one or two admirable negatives of him. The man himself possibly may not like them so well as a commonplace portrait. Never mind; a fine work of art will have been put in existence. At a proper time it may be brought forth. If it should be engraved, it will be spread broadcast, and go down to posterity. When it is looked at in future years, by persons of good taste and sound judgment, they cannot say of it, "What a pity the abominable fashion of shadow-pictures was in when that distinguished man was photographed," or "Pity he did not pose to one who had some artistic knowledge." But, on the contrary, they may say, "What a noble head; the man who posed it was truly an artist."

As to the practical details of lighting, all good photographers are pretty well provided with the means of securing almost any lighting which they may require. The main points to be looked after are, to have plenty of height, not too much over-head light nor too much side light, and be very wary of any light below the level of the head. Perhaps the greatest difficulty in lighting is to secure the very nice point between too diffused and too concentrated a light. In too diffused a light we have a want of force and breadth of light and shadow, and consequently a want of expression and vigour in the head; and on the other hand, if the light be too much concentrated, there is a harshness and force of character which is not only less agreeable than when a softer light is used, but far less likely to make a portrait that will be as acceptable to the general run of sitters as the soft lighting.

The timing of the exposure is of the utmost importance. The correct limit is extremely narrow in the highly sensitive plates now used in portraiture. An under-exposed plate is worthless. If we over-expose we have a resulting flatness in the picture which, if to be overcome, as it sometimes may, is only at a too great expenditure of time and pains to be admissible in gallery work.

In a properly lighted head, with correct exposure and development, in many instances very little retouching would be required. Certainly what constitute facial blemishes may in all cases be removed, but with persons of average good looks, as they advance in years, the stopping-out of all marks of time and character, and attempting to restore the look of youth, should be universally deprecated by persons of good sense.—*American Journal of Photography.*

## Patent Intelligence.

### Applications for Letters Patent.

11,900. Georges Messager, 45, Southampton Buildings, London, "Improvements in and Relating to Photographic Shutters."—July 13th.

11,915. Edward John Browne, 43, Smollet Street, Liverpool, "Photo Half-Tone Rubber Stamp."—July 14th.

12,114. Newnham Browne, 73, Cheapside, London, "Improvements in Photographic Apparatus." (R. Hüttig, Germany.)—July 16th.

12,176. Charles Thomas Abbott, 53, Chancery Lane, London, "Improvements in the Manufacture of Picture Frames."—July 16th.

12,218. Newnham Browne, 73, Cheapside, London, "Improvements in Detective Cameras." (Friedrich August Fichtner, Germany.)—July 18th.

### Specifications Published.

2,293. *March 29th*, 1890.—"Glass Frosting." W. H. Akester, 15, Munster Road, Fulham, Middlesex.

Relates to frosting or obscuring glass surfaces, such as glass globes used for incandescent electric lamps, and consists in dipping the article into, or otherwise coating the surface with a solution of nitro-cellulose. If desired, there may be added to the solution any colouring matter, as one of the aniline dyes. The article is afterwards dried in a drying chamber.

2,623. *February 18th*, 1890.—"Modifications of Zoetropes." L. Brennan, Gillingham, Kent.

Consists of a method of, and apparatus for, producing pictures or designs appearing to move and change, that is a method and apparatus for giving the same effects as the ordinary zoetrope. The complete apparatus may be divided into two parts, a fixed part and a removable part. The latter part consists of three frames, between which are bars, round which strips of paper are passed, the ends of each strip being held in the frame. The removable part is placed in frames carried on a suitable stand, and provided with two right and left hand screws, operated simultaneously by handle and gear-wheel. The front frame is fixed, the other two are free to travel towards and away from one another along guide rails when the crank is rotated. Plain paper strips being inserted, a picture is photographed, or in any other suitable way, placed upon all the exposed edges at the front. The crank is slightly turned, fresh surfaces or edges are exposed, on which a second picture, somewhat different from the first, is placed. The crank is again turned, a fresh picture placed on, and so on. By using strips, having pictures thus formed thereon, and by rotating the crank, a design or picture appearing to move and change is witnessed.

Correction.—In Mr. Debenham's paper on "The Cult of Indistinctness" in our last, the word "promising," 19th line, 1st column, page 518, should read "prominent."

The Photographic Club.—Subject for July 29th, "Developing *en route*"; August 5th, "Dark Room Appliances and Photographic Dishes." Outing July 25th, Waustead Park; train leaves Liverpool Street 2.35 for Snaresbrook.

Photographic Society of Great Britain, 50, Great Russell Street, W.C.—The subject for discussion at the technical meeting on July 28th is "Photographic Optics and Perspective." The rooms will be closed from July 29th to August 24th.

## Correspondence.

### THE NAMING OF PHOTOGRAPHS.

Sir,—When travelling abroad I am in the habit of buying photographs of the scenery, and lately I mounted some hundreds of them in scrapbooks. In doing so I noticed that the great majority of the names were marked in pencil on the back of the photos, and a large number of them in a more or less unsatisfactory manner. Some were written in a hand either difficult to read or quite illegible; others were vague and indefinite, such as "Oberland Mountains," or "Rhone Valley," and two were actually named "Swiss Scene" and nothing else, whilst several of the most interesting had no name whatever. I have also bought a great many photographs in England, and I find them just as bad as the continental ones in this respect, if not worse. I ought to add as a climax that I am able from my own knowledge to see that not a few bore entirely wrong names, and I could not but entertain an uneasy suspicion that many others might also be erroneous unknown to me. This state of things is not only a nuisance, but renders the photographs of far less value, and must, I should think, diminish the sale of them. I submit that *the names should in all cases be printed upon them*, as is already done by many photographers, especially in Naples and Venice, and not be left to a possibly ignorant shopman to scrawl something on the back, with the results stated above. W. M. Cooper.

*Guernsey, July 15th.*

### DELAYED FOREIGN EXHIBITS AT THE RECENT NEW YORK EXHIBITION.

Sir,—Some misapprehension having arisen as to the appearance, in the catalogue of the Fourth Annual Exhibition, of the names of one or two foreign exhibitors whose exhibits were not hung when the exhibition opened, an explanation is now deemed necessary in order to show that no injustice was done to such exhibitors.

It should be mentioned that the entry forms filled out for catalogue purposes were received by mail some time in advance of the exhibits sent by express; the committee, expecting they would arrive in time, favoured the exhibitor, as it thought, by inserting in the catalogue his name and description of exhibit.

In the case of Mr. Lyddell Sawyer, of Newcastle-on-Tyne, whose entry form was received ten days before his exhibit, which was delivered three days after the exhibition opened, and after the awards had been made, there was no chance, under the rules, for his exhibit to be framed and judged. It was, accordingly, hung "for exhibition only," by consent of the committee. It took twenty-one days from the time they were sent till received in New York. His work was admired by the many visitors, and would doubtless have taken a medal, as at many other exhibitions, had it come in time.

In the case of Mr. John E. Austen, of Maidstone, whose work has invariably taken a medal wherever exhibited, it should be stated that while his entry form reached the committee in time for the catalogue, his exhibits never came to hand, and at the time, though diligent inquiry was made about them of the forwarding agents, no trace of them could be found. This explanation should prevent Mr. Austen from being put in any false position.

A third case is that of Col. R. W. Stewart, of Devonport, who, instead of sending his entry form by mail, sent it by express with the photographs, which were received the third day after the exhibition opened, too late for entrance in the catalogue and for judging. He had excellent platinotype prints of the Westminster Abbey. They were hung for exhibition, and were much liked.

Few foreigners can imagine the delay even in getting the simplest article through the U. S. Custom House. In some parts of it one man has to do the work of two; then the articles have to be appraised, and must wait their turn. Usually ten days to two weeks are required, hence in sending articles to America this delay must be allowed for. It was for this reason that the committee urged all intending foreign exhibitors to send their pictures, unmounted, by mail. Those who did so had their exhibits here in ample time. Until our laws are changed, the present hindrance to a free interchauge of photographs is likely to continue. F. C. Beach.

*Chairman of the Committee of Arrangements of the Society of Amateur Photographers, New York, July 10th.*

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

Sir,—I thiuk the enclosed statement of facts may be of sufficient interest to the readers of the Photographic News to warrant your publishing.

Early this year I received a prospectus of an exhibition to be held under the auspices of the Society of Amateur Photographers of New York. As I had some "Interiors" of Westminster Abbey, which I thought would be of exceptional interest to Americans, I wrote to the secretary, Mr. F. C. Beach, and in reply received a form of entry to be filled in. The exhibitiou was to be held in New York between May 25th aud June 6th. I accordingly prepared a series of the interiors in platinotype, mounted them on cardboard, and despatched by S.S. *Umbria*, leaving Liverpool on the 18th April. The series consisted of one view 15 by 10, and twelve views 8 by 10. Early in June I received a postcard as follows:—"Your exhibits not received till yesterday, too late for competition and catalogue; sorry. I had to pay eight shillings charges to get it out of Custom House. We have them on exhibition at gallery, however. Very beautiful pictures.—Yours, F. C. Beach."

I wrote in reply showing date on which the photographs were sent off, &c. To this I had no reply until this moruing, when I received the following:—"Dear Sir,—Mr. F. C. Beach, of New York, has requested me to remit you seven shillings per balance due from sale of photographs, after deducting expeuses, and we uow enclose cheque for the amount, which kiudly acknowledge." The net result is, firstly, owing to the peculiarities of the New York Customs—a parcel leaving England on April 18th is not in time for exhibition in New York on 25th May; secondly, the net value of thirteen "very beautiful photographs," to quote the secretary's words, the catalogue price of which was £3 10s., after paying expenses, is seven shillings. I think comment is unnecessary.

A Member of the Camera Club.

## Proceedings of Societies.

Holborn Camera Club.

The usual weekly meeting of the Holborn Camera Club was held on Friday last, Mr. R. D. Lowe in the chair, when Mr. R. Luxton gave a very instructive and interesting lecture on "Photo-mechanical Work." He made special mention of the method of copying the picture, aud spoke of the various stages through which the plate passes, beginniug with the development and subsequent iutensification of wet plates, varnishing, the preparation of the zinc plate, the printing, washing, rolliug-up, and bitiug iu. He gave various formulæ and numerous hiuts during his lecture. He showed a wet plate after intensification, and zinc plates iu the various stages of process. A vote of thanks was passed to Mr. Luxtou, aud the meeting separated.

Lowestoft and District Photographic Society.

A meeting was held last Friday at the School of Science and Art, Regent Road, Mr. W. Stringfield presiding. Prints and negatives were handed round, including a "Wood Scene" by Mr. Emuss; two prints, shown by Mr. A. M. Smith, one of a camp kitchen, taken during a late encampment of the Volunteers on the Denes, also an enlarged print of Mr. Gladstone leaving the station on the occasiou of his visit to Lowestoft in 1890; examples of a new method of printing, shown by the Chairman, after which some slides were thrown ou the screeu, one by Mr. Hume, of "Cattle on the Marsh."

The meeting terminated with a resolution that all members be requested to produce next month, all the slides they had previously exhibited, with a view of selecting those most suitable for a public exhibition, to be held iu the autumu, on behalf of the funds of the Society.

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C S., 2, St. Mary's Road, Canonbury, N.

R. M.—*The Oxy-Chloride Theory.* Dr. A. Richardson, of Bristol, in studying the decomposition of silver chloride by light, has, by a series of conclusive experiments, proved that there is *no oxygen* in the blackened product, and that Prof. Hodgkinson's hypothesis has no foundation in fact.

D. D.—*Law of Copyright.* See answer given to C. A. last week.

E. P. (Ludlow).—*Exhibition,* 1891. The judges have been appointed, and the printed regulations governiug the forthcomiug Pall Mall Exhibition may now be had, together with entry form, from the Assistant-Secretary, 50, Great Russell Street, W.C.

Amateur.—*Permanence of Pyro Solutions.* We have made comparative trial of solutions of pyrogallol preserved respectively by additions of nitric acid and of sodium sulphite with citric acid. Both are fairly and equally permanent if kept in stoppered bottles away from the light.

A. L. B.—*Egg Statistics.* The Minister of Agriculture (Mr. H. Chaplin, M.P.) reported at the Mansion House meeting a fortnight ago that eggs to the value of £3,400,000 were annually imported into this country. This estimate takes no account of a large additional quantity of egg-albumen, which comes over in the form of albumenised paper ready for photographic use. From these statistics it is again made clear that there is room for the development of this item of dairy produce by the efforts of British and Irish agriculturists, besides the extension and promotion of fruit culture, which constituted the maiu object of the Fruiterers' Company in calling the meeting.

M. W.—Second letter answered by post.

Amicus.—*Platinum or Silver.* It is entirely a matter of taste; for portraits, as a rule, we should prefer silver, but they would not be so permanent. Interiors and architectural details ofteu come out better with platiuum, but for foliage aud the usual run of laudscape work we are still inclined to favour the print in silver.

B. E. N.—*Hardwich's Manual of Photographic Chemistry.* The first six editions were prepared by the author; the seventh was edited, in 1863, by Messrs. Dawson and Hadow; the eighth by George Dawson alone in 1873, after which Mr. J. Traill Taylor took it in hand, the ninth edition appearing in 1883 of largely increased size.

R. L.—*Primary Colour Sensations.* You will find these points fully treated of in Professor A. H. Church's Cantor lectures, published just a year ago. See *Journal of the Society of Arts,* July 4th, 1890, page 747.

D. C. (Bolton).—*Reduction by Sodium Amalgam.* We fail to see what advantage your method possesses over the ordinary process of reduction by zinc. Granting that all the silver will be thrown down, you would still have an amalgam to treat, and without special appliances the driving off of mercury fumes might be a deleterious or actually poisonous occupation.

J. H. G.—*The Brussels International Congress* will hold its meetings from the 23rd to 30th August at the Palais du Midi, Boulevard du Hainaut, under the presidency of M. Joseph Maes, and will take into consideration some questions left undecided or remitted from the Paris Conference, besides a goodly number of fresh enquiries arranged uuder ten headings. For particulars apply to M. Ch. Puttemans, organising secretary. Delegates are admitted free, but from other persons wishing to attend a small fee of ten francs has to be paid, which covers for one copy of the report. Unfortunately, the date of the Brussels Conference overlaps the time fixed for the meeting of the British Association at Cardiff.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1717.—*July* 31, 1891.

CONTENTS.



## PHOTOGRAPHS *VERSUS* LITHOGRAPHS.

Of all the varied abominations published under the profaned name of art, surely none can compare with the common lithograph of German origin which confronts one at this season of the year at every seaside lodging-house, and which are to be found in every cottage home in the kingdom. The coloured glass vases on the mantelpiece, the lustres (also "made in Germany"), the uncomfortable antimacassars on the chairs, the Berlin wool mats on the chiffonier—there is always a chiffonier—are disagreeably aggressive, but they are not so terribly self-assertive as that German lithograph in its veneered maple wood frame which hangs on the wall.

As works of art, these pictures are utterly bad, and if there were not, unfortunately, in this country a great lack of artistic discernment among the general populace, they would never have found a sale. But the same feeling which prompts the multitude to listen to and encourage a street band (also "made in Germany"), with its shrieking clarionet, its blatant cornet, and its snorting trombone of three notes, will also influence it in buying and proudly exhibiting on the home walls the lithographic trash which is as nasty as it is cheap. Both bear the semblance of art, and both appear to be good enough to tickle the uncultured senses.

The producer of these lithographs has, after the manner of his countrymen, been keen enough to see a demand and to create a supply in a field which to Englishmen looked unpromising and barren. He knew that cottagers and lodging-house keepers of the more humble kind could not afford oil paintings or line engravings with which to decorate their walls. His knowledge of human nature also told him that pictures of some kind they would have if they could only get them cheaply, and so the German lithograph was conceived.

The German producer has striven to present to the uncultured eye a cheap something which, in subject and size, shall prove attractive, and he has certainly succeeded in his efforts. He has also been clever in at once acknowledging the truth of the Shakespearian adage which tells us how "one touch of nature makes the whole world kin," and has rung the changes on touches of nature to the verge of idiotcy. He is great in scenes which illustrate the domestic virtues, and we have pictures of abnormally clean cottagers and their children sitting down to meals, and engaged in various other laudable and necessary occupations. Or we have a pair of wooden-faced lovers standing near a stile, with the church embosomed in trees in the middle distance, hinting at probable matrimony. Every face is smug and smooth, and has as much expression in it as that of a cabbage. But the teutonic producer does not stop at these original flights of genius, but actually has the audacity to serve up with the same hideous garnishing well-known pictures by our own English artists. Landseer's noble dogs are degraded into stuffed animals with impossible limbs, and with all their force and character washed out of them; and Millais' "Black Brunswicker" takes the form of a pudding-faced youth with an expression of utter vacancy. It is, indeed, a grave reflection upon a people which boasts of a national gallery like our own that such things should gain currency, but that they sell well is a melancholy fact about which "there is no shadow of doubt whatever," and evidence of which is furnished by all the "furnished apartments" in the kingdom.

But it is of little use to diagnose a disease unless we can point out a remedy, and, in this case, we think that we can indicate a means whereby the lithograph can be ousted from the position which it occupies in the estimation of the uneducated public. We must at least thank German enterprise for showing us that there is a vast mass of customers for pictures spread all over the rural parts of the kingdom, and we must now consider whether we cannot supply the demand ourselves, instead of leaving to others that profitable business.

Now, is there not here an opportunity for photography to step in? It may be argued that the people have already an opportunity of hanging their walls with most exquisite pictures gathered from the holiday and Christmas numbers of our leading illustrated papers. This is undoubtedly the case, and the most popular picture ever published in this way—Millais' "Cherry-ripe"—is hung in many a room. But still, there is the feeling, common to us all, that a picture which so many people have a chance of acquiring is not quite so desirable as one which is a little more rare. The German travelling pedlar carries a large variety of works with him, and one dweller in a village will take care that he does not buy the duplicate of a picture already purchased by a neighbour. We may also suppose that the polished frame, with its gilt edge, has something to do in tempting the purchaser.

In pitting photography against these cheap lithographs, we have in mind the number of exquisite pictures annually exhibited at the different exhibitions, the ready means by which such pictures can be enlarged, and the number of processes available for reproducing them. A good photograph of an attractive subject, enlarged if need be, reproduced by the Meisenbach method, and carefully printed, is far finer than anything that lithography can do, and we believe that in quantities it could be produced quite as cheaply. Collotype pictures could be turned out at a slight increase of cost, and would probably meet with a large sale. Higher priced pictures might owe their existence to Woodburytype, and carbon and photogravure would still meet—as they do now—with a fair share of patronage from the more wealthy. Of course such a business cannot be started without effort and energy, for the people will not come to buy; they must be sought out. When once they are able to compare the German monstrosities with the photographs, and receive a guarantee that the latter will not fade, we feel certain that they will not hesitate to avail themselves of the better and newer form of art. We think that there is money in the idea, and manufacturers would do well to give it their consideration.

We are quite aware that in these hard times the producer's first question must be, "Will it pay?" but in the case before us he cannot fail to feel a certain satisfaction in knowing that he is influencing for good the popular taste, and inculcating among our least educated classes a desire for something a great deal better than they have been accustomed to. Better ideas of this nature lead to more noble aspirations in other matters, and such feelings are much wanted in England just now, notwithstanding the boasted march of civilisation.

Brighton Photographic Society.—Mr. A. H. C. Corder, the hon. secretary, asks us to notify his removal from 42, Moutpelier Road, to 77, Buckingham Road, Brightou.

Iodides in the Developer.—Herr Lainer, of the Vieuna Institute of Photography, has been examining the action of iodine and iodides in hydroquinoue, eikonogen, aud pyro developers, and has found that their action is precisely the opposite to that of bromides; the latter, as is well knowu, teuding to the increase of contrast, whereas iodine and iodides tend to produce reduction of contrast, and, if used in excess, to very flat negatives. A 1 per cent. solution of iodine iu equal parts of alcohol and water is recommended, and the addition of 2 or 3 drops of such tincture to every ounce of developer has a striking effect.

## REMARKS ON DR. EMERSON'S "NOTES ON PERSPECTIVE DRAWING AND VISION."

BY W. H. WHEELER.

Dr. Emerson's paper, entitled "Notes on Perspective Drawing and Vision," followed so closely on that in which I had endeavoured to direct attention to the mental theory of visual perception as capable of explaiuiug apparent anomalies in photographic perspective, that some remarks might naturally be looked for on my part. As it happened, I did not see it for some weeks, and being disappointed, for the present, in my hope of finding leisure to continue the development of my own views, I would ask of you space to say that, though welcoming Dr. Emerson's testimouy as to the geueral fact of such discrepancies—which must ever exist, our judgments being continually warped and modified by causes varying momentarily and individually, though some are pretty constant and general—I cannot at all agree with him as to their cause and character. Indeed, I find so much at the outset of what seems to me very like confusion of thought,* aud of the ignoring of well accepted theory, both mental and physical, that I can only now comment on these points.

Dr. Emerson tells us, in Proposition A, that "that portion of the eye which perceives distance and distant objects (*i.e.*, those above the ground) sees the objects on a larger scale thau the portion of the eye which views the foreground or nearer objects, therefore our impression of nature is uot what we get with a mathematically correct perspective drawing, or the drawing of an aplanatic photographic lens. (To say a rectilinear doublet lens would be more accurate—aplanatism has nothing to do with the matter.) That is, a perspective drawing surprises us by making the foreground objects look larger in proportion to the distance"—than what? Presuming Dr. Emerson's meaning to be "than agrees with our ordiuary perception," there is, I think, no doubt about the truth of this last sentence, and a most important truth it is. But the earlier part of the proposition contains implied assumptions which I look on as profound misconceptions, so greatly at variance with the accepted theories, both mental and physical, as to be well worth endeavouring to unravel.

We see, first, that the accepted mental theory, according to which distance can never be directly seeu as such—that is, it can never be apprehended as simple sensation in the way that differences of colour, brightness, &c., are apprehended, but must always be inferred through an act of judgment, interpreting the signs presented to us through sensation—is eutirely ignored; and distance, as well as distant objects, are mentioned as though both were actually seen, aud that, indeed, by a portion only of the eye. Yet not only the comparatively subtle and complex inferences drawn from our knowledge of real or actual magnitudes, compared with our estimates of apparent magnitude, or from running the eye over a succession of intervening objects, or from atmospheric softening—by all which we may estimate considerable distances—are distinctly acts of *judgment*, but also the accommodative action of the ciliary muscles—the co-ordinated movements required in binocular vision to converge the axes of both eyes to the same spot; and all the parallactic effects of moving the head, or otherwise changing the point of view,

* What can be meant by the sentence, "and prove the fallacy of photographic and all mechanical methods of measurement"? Are *actual* or *apparent* magnitude referred to, or is it the difference existing between the two?

by which we generally judge of nearer objects, are only known to sensation *as such.* In themselves, they are merely signs which must be mentally interpreted before we can apprehend *distance.*

The accepted physiological theory fares no better than the mental one. It is well-known that *distinct* vision is obtained only when the part to be distinctly seen is centrally incident on the retina. Let anyone watch his own vision while reading, or, still better, watch the eyes of another reader as the direction of their axes moves along each line of the book under perusal, and he will understand what is meant. Wundt uses the fact as a metaphor to illustrate the psychical doctrine of attention; and Mr. Jas. Sully, in an article headed "Unconscious Psychical Activity,"* says: "To adopt the metaphor of Wundt, the whole mental region (conscious and sub-conscious) answers to the total field of view present to the eye in varying degrees of distinctness at any moment when the organ is fixed in a certain direction. The latter region, that of attention or clear consciousness, corresponds to that narrow area of 'perfect vision' on which the glance is fixed.

It would, perhaps, seem natural to suppose that these facts, relating as they do to our daily experience, should have been generally recognised, and be constantly present to our minds. But we are all accustomed, when gazing on a scene, to turn the eyes instantly on any part we desire to see, and then, having placed at least one clear vision of each part on the memory, it is held there by the faint sub-consciousness of it which sensation can produce when not looked at directly; and, while it is imaged on an outer part of the retina, we are apt—all unaware of the really intricate complexity of these combined mental and physical processes, and perhaps thinking of it all simply as "sight"—innocently to attribute the comparative clearness of the mental image—which, though partly produced by obscure sensation, is illumined by a more vivid memory—wholly to that present sensation, which is, nevertheless, quite insufficient by itself to produce it.

It is thus difficult for us adequately to appreciate the real indistinctness of our visual sense of those parts of the general image which are away from the centre of the retina, and of which we cannot actually have—except as refreshed by at least one direct glance—any sense approaching the clear vision physically accompanying central definition, and the clear consciousness mentally accompanying the directed attention. Without at least one direct glance we can possess only an imperfect or sub-consciousness of them. For to the necessary optical indistinctness of oblique pencils, is here added the difference in sensitiveness between the outer parts of the retina, and of the central parts—especially of the *fovea centralis*, or small central pit—marked by the presence of fewer "cones" and more "rods." To these again is added, in general experience, the effect of comparative inattention, blurring and confusing the mental impression. For our constant habit is always to accompany attention by so directing the eyes as that the point to which that attention is directed shall be imaged on or near the *fovea centralis*; and as the attention is directed, so the axes of both eyes are converged, and also the ciliary accommodation is made. As Helmholtz says, "Just as quickly as the eye turns, does the accommodation change," and "Whatever we want to see we look at, and see it accurately; what we do not look at, we do not care for at the moment, and so do not notice how imperfectly we see it."* In the light of these well accepted theories, it is difficult to treat seriously such a phrase as a "portion of the eye which perceives distance." For, first, the perception of distance is far more than the visual sensation of a distant object, and necessarily includes the mental interpretation which attributes distance to that object. Secondly, the signs which are thus interpreted have been obtained from many complex sources, including distinct sensation on the *fovea centralis*; to which part it is, indeed, very difficult for us, even by direct effort, to *avoid* bringing the image of any object to which attention is even momentarily directed. For these reasons we may be quite sure that both the distant and near parts of the view have all been seen, and the distances all inferred, from vision or the memory of vision, when imaged on this *fovea centralis.* Different parts of the image cannot, therefore, definitely correspond to different parts of the ever-moving eye, as they may with different parts of a photographic lens, whose stony gaze is fixed and unvarying.

It will be found that all the experiments recorded partake more or less of this same character—they are all *judgments.* For they are in no instance merely crude sensations, but perceptions which have been interpreted from sensations by mental action. It is in vain, therefore, to search for their origin among physical causes, such as imagined "naturally selective action of the retinal nerves." For if such action were even demontrated, we could thus only obtain signs to be mentally interpreted. We must turn to the mental rather than to the physical side of our nature, and then all may become comparatively clear.

* "Outlines of Psychology," p. 74.

* Helmholtz's Popular Lectures, p. 214.

## GLASS ETCHING.

"White acid" is a name used by glass etchers to designate mixtures of hydrofluoric acid with various chemicals which are used for matting the surface of glass. The discovery of white acid is due to Berzelius, who, while engaged in his investigations on the properties of glass, made the discovery that fluoride of ammonia had the property of matting or opaquing glass. Since that time it has been found that other alkaline fluorides possessed the same power, and during the last few years this has been taken advantage of on a large scale for producing ornaments on glass of the greatest beauty. It is employed, principally, for producing ornamental figures on door lights, although it is used very extensively for decorating glass ware for table use, and also for the various sorts of globes used on lamps and gas fixtures. Extremely fine effects may be obtained on mirrors, and the silvering may be placed on either the same or the opposite side from the etching.

During the last few years etching on glass has shown itself as a formidable rival to the sand blast, the work generally being indistinguishable from that produced by the latter, except that acid is capable of producing effects of a much greater fineness and delicacy. The grinding is much more even, and therefore more easily cleaned.

In Germany, where the art has been carried to a much higher point of perfection than elsewhere, a number of formulæ for matt-etching are in use. Within a short time some of these have been published in various scientific journals, but they all belong to the category of what might be called slow acids, and are very unreliable and uncertain in their action, and possess very poor keeping qualities. They are made without the ammonia salt, and are dependent on soda and potash for their action, take a long time to work, and are too uncertain for practical use.

There is no doubt whatever but that the white acid compounded with fluoride of ammonia is the best. In using other white acids, spots and streaks often form in the glass, and these cannot always be removed by repeating the etching. With ammonia acids, however, any streaks which may appear, either from applying the acid unevenly or from imperfections in the glass, may be removed by repeated etchings. The following recipe is one which is used by several practical glass etchers, and is said to give good results. It is of German origin, and the only objection to it is that it is too complicated, which objection may also be raised to other recipes from the same source.

In a container of lead the following mixture is made :—

| | | |
|---|---|---|
| Distilled water ... ... ... ... | 500 | parts |
| Fluoride of ammonia (strong) ... ... | 500 | ,, |
| Sulphate of ammonia ... ... ... | 50 | ,, |
| Sulphuric acid ... ... ... ... | 100 | ,, |

This solution is ready for use within two hours, and may be tested by immersing a piece of clean glass, which should get a nice, fine matt surface after five or six minutes.

In practical experience the writer has found that a simpler method of preparing the acid than the foregoing is capable of giving good results. Besides being cheaper, it is possible to recover the materials in it, should it for any reason get out of order.

A container of sufficient size is filled one-third full of ordinary commercial hydrofluoric acid. Carbonate of ammonia is then added. About equal parts by weight may be used. When effervescence has ceased, a small slip of clean glass is immersed in the mixture and permitted to remain six or eight minutes. Upon withdrawing, it is rinsed in clean water, wiped, and dried. If examination shows that it has become evenly translucent over its entire surface, the mixture is all right and may be used for regular work. If, however, it is deeply and irregularly etched, with some parts clear and some parts ground, the acid is in excess and carbonate should be added. If, on the other hand, the glass seems to be only partially affected by the acid, and, while being slightly ground all over, is transparent, too great an amount of ammonia has been used, and acid must be added.

With a little experience, it is possible to keep the balance between the alkali and the acid, so that good results can be obtained. All white acids are subject to change in their action from day to day, but in none of the recipes the writer has used can it be so easily regulated as in the foregoing. Before trusting any important work to the action of white acid, the acid should be tested with a clean piece of glass, and by following the hints given the acid can be corrected to give the proper action.

In preparing glass for etching, any of the ordinary resists may be used. The drawing may be either put on glass by means of a ruling pen dipped in asphaltum properly diluted, by means of a brush, or by means of the somewhat antiquated process of covering the entire plate with Brunswick black, and scraping away the parts which it is desired to grind. The best method, however, is that in which tin-foil is used, a description of which must be deferred to some future time. The design can also be transferred or photographed on glass if desired.—*Scientific American.*

## THE PHOTOGRAPHIC WORK OF HERSCHEL AND FOX TALBOT.*

BY WILLIAM LANG, JUN., F.C.S.

A COMMUNICATION from Talbot to the *Philosophical Magazine* on "A New Property of the Iodide of Silver" may be here referred to. It appears at p. 258, vol. xii., and is a note of the appearance that silver iodide presents when heat is applied. A pale primrose yellow, when cold, this salt, when exposed to the heat of a fire, turns to a rich gaudy yellow. Before passing on to consider Talbot's later researches, I may be allowed to refer as briefly as possible to some of his earlier work, giving the original source of publication.

In 1826, "Some Experiments on Coloured Flame," *Edinburgh Journal of Science*, v.

In 1827, on "Monochromatic Light," *Quarterly Journal of Science*, vol. xxii.

In 1833, "Remarks on Chemical Changes of Colour," *Philosophical Magazine*, vol. ii.

In 1834, "Experiments on Light," *Philosophical Magazine*, vol. v., p. 321—334, and "Royal Society Proceedings," p. 298, vol. iii.

In 1835, on "Nature of Light," *Philosophical Magazine*, vol. vii.

The foregoing by no means exhaust the scientific contributions of Talbot. His mathematical memoirs were considerable. A Royal Society's medal was awarded him in 1838 for "Researches in Integral Calculus."

Dealing again with the year 1839, we find Talbot making a short communication to the Royal Society on March 21st, the title of which is "Note respecting a New Kind of Sensitive Paper." In using bromide of potassium instead of sodium chloride, the author finds that greater sensitiveness is manifested. He also refers to a mode of making a negative design on glass by blackening the same by means of the smoke of a candle, and etching out the lines by means of a needle point.

The ninth meeting of the British Association was held at Birmingham, in 1839. It opened its proceedings on the 29th of August, ten days after the public announcement of Daguerre's method. Accordingly, we find Talbot contributing a paper to the section of Physics and Mathematics, dealing with the Frenchman's discovery, "Remarks on M. Daguerre's Photogenic Process." Talbot's paper is, for the most part, taken up with the consideration of the optical phenomena presented when a particle of iodine is laid on a silver plate and afterwards gently treated. He seems, moreover, to doubt the superior sensibility of Daguerre's plate over his photogenic paper. The discussion that ensued is reported in No. 618 of the *Athenæum*, August 31st, 1839.

Up to this point, as we have seen, Talbot had been busying himself with the obtaining of actual images, "printed out" subjects, as we would now call them. Talbot's own words, referring to his calotype process, may be here quoted; they are taken from the appendix already alluded to. "The discovery of the latent image and the mode of its development was made rather suddenly on September 20th and 21st, 1840. This immediately changed my whole system of work in photography. The acceleration obtained was so great, amounting to fully one hundred times, that, whereas it took me an hour to take a pretty large camera view of a building, the same now only took about half a minute, so that instead of having to

* Concluded from page 524.

watch the camera for a long period, and guard against gusts of wind and other accidents, I have now to watch it for barely a minute or so. Portraits were now easily taken in moderate daylight. One of the first portraits taken was sent to the French Academy of Sciences, where it excited great interest, and was passed from hand to hand, and afterwards to the public in the galleries, my friend, M. Biot, being my informant.

"I soon drew up an account of this new process, which I named the calotype, and transmitted it to the Royal Society."

The memoir in question was read at the Royal Society meeting of 10th June, 1841, its title being "An Account of Some Recent Improvements in Photography." The process, briefly stated, consisted in forming silver iodide, in the first instance, on the surface of paper, sensitising thereafter by means of gallo-nitrate of silver, developing the image after exposure by further applications of the gallo-nitrate solution. The fixing was effected by means of a soluble bromide. The process was patented in February, 1841, but in 1852 Talbot, with certain reservations, gave the right to work it to his countrymen. Specimens of early calotypes I have here with me, and can be inspected afterwards. The Calotype, or Talbotype, was a negative picture, the positive reproduction of which was obtained by means of his photogenic paper. By a modification of his process, Talbot worked out a method whereby positives were secured in the camera. The *modus operandi* was as follows: Sensitised calotype paper was exposed to sunlight till a visible browning took place; afterwards it was dipped into a solution of potassium iodide (25 grs. to oz.), washed in water, dried with blotting-paper, and a good full exposure given in the camera. Development by means of the gallo-nitrate solution was then resorted to, when a positive reproduction was obtained. I pass a camera picture round secured by this method.

In 1842 the Rumford gold medal was awarded Talbot in recognition of his photographic discoveries. At the Cork meeting of the British Association in 1843, Talbot was asked by the general committee "for his report on photography and its applications to be presented, if possible, at the next meeting." The report asked for does not appear, but we find a communication from Talbot detailing his experiments on sulphate of iron as a developer in his calotype process. As is well known, the proposal to use ferrous sulphate emanated from Robert Hunt. The short abstract of Talbot's paper will be found at p. 105 of Report of Transactions of British Association for 1844.

In 1843 Talbot was over in Paris for some little time giving lectures and demonstrating his process.

In 1844 the first part of the famous "Pencil of Nature" made its appearance. Its publication extended over a period of two years, several unforeseen difficulties having been met with. There were six parts in all, and twenty calotype illustrations in the complete work. In 1845 another work was published having similar photographic illustrations, with the title of "Sun Pictures in Scotland." Both works are here for inspection of those interested. In 1846, in the *Art Union* number for June 1st, an article entitled "The Talbotype Sun Pictures," evidently inspired by Talbot, forms the first contribution. As a supplement a calotype was furnished with each number. There must be still extant a goodly number of these pictures hidden away in old bookstalls and in libraries. The original issue was something like 7,000, and a large number of negatives seem to have been employed. In all those reproductions which I have seen I have not yet met with a duplicate. I have with me for inspection two of these early Talbotypes.

In June, 1851, a remarkable experiment was performed by Talbot at the Royal Institution. A printed paper was attached to a wheel, which was made to revolve rapidly in the dark. On illuminating the paper for a very brief interval of time by means of the electric spark, a photographic transcript of the printed matter was obtained on a plate prepared by a method described in the *Athenæum* of December 6th, 1851. The process was patented by Talbot.

In 1852 Talbot secured a patent for photo-engraving. He gave the name of photoglyphy to his method, and made use of the well-known action of light on bichromated gelatine, the etching of the plate being performed by means of iron perchloride. A subsequent patent was taken out in 1858, the improvement consisting in the application of a resin to the plate before commencing etching operations. A supplemental illustration of this mode of engraving was issued with No. 10 of the Photographic News, appearing November 12th, 1858. Several plates were employed to give the necessary number of prints for the circulation of the paper; we find, therefore, that the subjects depicted are somewhat varied, and they mostly are all Continental. A more perfect illustration appeared with No. 54 of the Photographic News, September 16th, 1859 (Vol. III). In this supplement there was only the one subject chosen, a view of a portion of the Tuileries. The plate which furnished the proofs was copper, and had been steel faced. I regret that I am not in a position to show specimens illustrative of Talbot's photo-engraving. A specimen of a half-tone engraving appears in a second edition of "Tissandier's Photography" already referred to, as also a specimen of line work. These, as I have the book with me, can be seen. Several other patents connected with photographic applications were applied for. We need only refer to one taken out in conjunction with Malone for the use of unglazed porcelain instead of glass, and employing an albumen process.

Enough has been said to show how very assiduously Talbot must have worked at the various photographic methods he from time to time brought forward, but other scientific matters engaged his attention as well. It would be beyond the limits of this communication to enter into these. We are only more immediately concerned with the facts which we have just glanced at. I regret that the marshalling of these had not fallen into the hands of one more capable of rendering full justice to them. It will be our privilege, as a Convention, to visit the shrine of Lacock Abbey, where the illustrious Talbot worked, and surely that "building which was the first that was ever known to have drawn its own shadow," to use Talbot's own expression, must have an interest and significance to the photographic pilgrim which to the ordinary visitor will be completely wanting.

---

Reducing Over-Dense Negatives.—Belizki recommends the following formula. It must be mixed in the order given:—

| | |
|---|---|
| Water ... ... ... ... ... | 200 parts |
| Potassium ferric oxalate ... ... ... | 10 ,, |
| Sodium sulphite (neutral) ... ... | 8 ,, |
| Oxalic acid ... ... ... ... | 3 ,, |
| Sodium hyposulphite ... ... ... | 50 ,, |

It will retain its working strength if kept in the dark, and may be used over and over so long as it has a green colour.

## SHADOWS IN PORTRAITURE.

BY XANTHUS SMITH.

THERE is so much attention given to the subject of *lighting* in photographic portraiture—so much talking and writing about where the light should come from, and how much there should be of it, and in what way it should fall upon the features—that it seems to the writer that the very important subject of the shadows is being entirely overlooked, and he humbly begs leave to offer some remarks upon this, as he considers it, very important factor—namely, shadow—in the art of making a good likeness and an agreeable picture.

Shadow is the repose of art, the sentiment of art, and the web of setting, as it were, for our lights. It gives us our contrasts and our relief. It is by the breadth and depth of our shadows that we get the true values and brilliancy of our lights, and those forcible effects which are so sought after by great painters.

All who have read about or paid any attention to the subject of art know that the secret of the great painter Rembrandt's success was his skilful mastery of the principles of shadow. He subordinated all else to it, and it is in consequence of the very large proportion of shadow in his works that his lights stand out with such marked effect. While many painters considered one-fourth a sufficient amount of shadow for a picture, Rembrandt often reduced the amount of light in his works to one-eighth, and, although it would not do for all to venture so large a predominance of shadow—for what with Rembrandt produced brilliancy, with imitators resulted in sombreness and heaviness—yet, by a careful study of shadow and its proper management, we may expect to attain some of our finest effects.

Mystery is an important quality in art. The inquiring and inventive faculties of the mind are occupied by it. When all is spread before us at once, under a brilliant illumination, the eye passes over the subject, takes in all with quick comprehension, and is as quickly satisfied; but when much is subordinated, obscured, in a measure hidden, then do we search and build up in our fancies ideas in harmony with the subject and agreeable to ourselves. Poets and lovers of nature, and painters as well, love to dwell upon her in the early morning or in the evening hours. Why do they treat with indifference the brilliant glare of noonday sunshine? Simply because it is in the morning and evening that they find that predominance of shadow which gives nature its repose and sentiment, and, we may further add, its solemnity and impressiveness. It is then that the fancy may have full play in the broad passages of quiet repose, and the eye be gratified by the sparkling lights; it is then that nature gives us her pictures, instead of yielding up her every separate feature.

Shadow is the great modeller, the moulder of form. By its judicious use in portraiture we round up our heads, produce the overhang of our eyebrows, cause our noses to protrude, and give shape to our mouth. We have only to pose a sitter in front of and directly facing a large window, and photograph him thus, to be fully convinced of the just value of well-cast shadows. The head and face will be amply lighted—no one can dispute that; but who would be satisfied with such a miserable, pale, flat representation of themselves as would result from such a picture? Under the eyebrows, under the nose, and under the chin would we have the same illumination as on the forehead, cheeks, and, in fact, all the other prominences? Instead of an intelligent countenance we would have a pale, glaring stare. Now let us obscure the lower half or two-thirds of our window and try another picture, and see what a difference we will have wrought.

A high, soft lighting is undoubtedly the proper one for the majority of sitters. Occasionally we see individuals, more generally ladies and children, possessing some peculiar piquancy of expression, who will make taking pictures in almost any pose or lighting. Such heads are apt to find their way into the show-cases, provided permission be obtained to exhibit them. These pictures are well because their excellence is founded on the intrinsic symmetry of the face. It is when we come to deal with the average man and woman that our greatest difficulty arises, because, being neither picturesque nor beautiful, they drop into the common-place. People do not generally admire themselves treated in a common-place way. They all want to be made to look handsome, and with more dignity than they possess. Like the young fellow who volunteered to pose to his artist friend for the head and figure of Brutus, and, being aware of his very insignificant appearance, said: "Now, Brush, you will have to throw in all the dignity of the noble Roman, you know." The safest way with this large class of sitters is a good bestowal of shadows just where they are wanted. Not too strong and black, but full and soft, and the lights soft also. It is only in the heads of marked character, and when the individuals themselves permit it, that very vigorous shadows may be allowed, and then we have good pictures of a higher artistic order, which may be characterised as picturesque.

We sometimes see in show-cases photographs of individuals taken under some trick treatment, which, though rather attractive at first glance, will not bear analysing and study, and which, if we have occasion to pass the place frequently, become excessively disagreeable and annoying to us. One of these tricks is obscuring the face in shadow with a harsh line of light on one side. If you have a lean, hatchet-faced man or woman with a very prominent nose, and treat them after this manner, especially large, you will have something attractive, certainly, but you won't find its charms lasting. We all know that we may have too much of a good thing, and, indeed, with many things the better they are the sooner we surfeit of them, and so we may have too much shadow. We must remember that a countenance may be overwhelmed with shadow. The shadow is to be used to develop the features, and not to obscure them. We must make shadow our servant, and not allow it to become our master. We too often see in the show-cases at the entrance to prominent photographers' galleries, and where there is a display of an abundance of elaborate work—work which has called forth the greatest knowledge and skill in technique to produce—a universal misconception of the true use of shadow. In many instances, in fact, shadow seems to be the aim and end, as if shadow should be the picture, instead of the means of producing it. How disappointing it is, for instance, to see a series of fine, large heads wherein the sitters have been posed against an even half-shadow background, and the entire face thrown in shadow, or rather half-shadow, except one temple and the nose, the light having been kept well back. Of course the back of the head, ear, and back of the neck are in strong light. This, with a well up-turned face, three-quarters, or nearer profile, and as complacent an expression as can be got, is a favourite mode of treatment, and very absurd when looked upon as anything but a curiosity; and a still more objectionable effect is when the head is posed against a white background and lighted from back, no reflection used on the shadow side, so that the face cuts very harshly against the ground, the whole face appearing very dark except the nose, which, with the upper corner of the forehead, gets a full whack of light. Now you see that, owing to the nose being a very prominent feature, it is difficult in this shadow treatment to make it succumb to the rest; it will stick out and catch some light in spite of us, and even when it is a handsome nose, it ought scarcely to receive all the light when the rest of the features are not receiving any. Another difficulty with shadow pictures is to prevent all the lower portions of the face from falling into too low a tone, because, from the cheeks rounding in, and the chin receding, and the mouth being overshadowed by the nose, the bottom half of the countenance is lost. An excellent way to study these matters is to look at such work with your eyes nearly closed. In this way you will lose all the details, and you will perceive only the main masses of light and dark. You will then perceive how absurd the effect often is, and you should never lose sight of the fact that your main masses of light and dark must be well composed if you are to produce a good picture. The features of man are so formed and combined that, with knowledge and care in the bestowal of the shadows, a perfectly harmonious arrangement is produced even in the blocked-out mass, regardless of the finer details, and when the details are wrought upon a justly arranged foundational effect, we have the most perfect whole as a result.

When it is desirable to make what is called a shadow or Rembrandt picture of a head or half-length, a much better effect is got by using a black or very dark background, because the flesh then at once takes its place as half-shadow, and, by contrast, has a certain luminousness; while against a middle tint or very light background it will appear dull and heavy. But such treatment—that is, casting the face in shadow—is best suited for handsome sitters, and where the plumpness of youth gives the flesh an evenness of texture that aids in securing softness. With the hollowness and wrinkles of age, dullness and hardness is too apt to be the result. Much has been attained in some galleries where great pains has been bestowed in the matter of the casting and formation of shadows. The almost insurmountable difficulty of harshness of contrasts has been greatly overcome. It is a subject that requires much knowledge and practice. Nor should it be a matter of surprise to the photographer that it is so. Is not the work of the beginner in painting hard? and does it not take years of study and practice to enable the portrait-painter to attain the vigour and, at the same time, the softness and harmony of a master? The man who attains the most vigorous contrasts of light and dark —for that is what makes the work telling upon the eye of the spectator, and, at the same time, avoids harshness and consequent hardness in his work—is the successful man from an artistic point of view.

In order to make a good artistic head, the deepest touches of shadow should come under the eyebrows, under the end of the nose, and about the mouth and chin. These should be supported by a proper amount of half-shadow coming about the eyes, under the cheeks, and about the chin, falling in such a way as to give a proper amount of roundness to the face and projection to the features. All this can be greatly aided by a nice timing of the exposure and careful development. How often do we see, even in large, carefully-got-up heads, a perfect uniformity of whiteness in all the directly lighted portions—the flesh, the white hair and beards of old men, and the white linen of collar and shirt-bosom being identical in whiteness. This should not be. The linen should represent the highest light, the hair should come next, and then the light flesh, a little lower in tone than either of the others; and then, in the flesh, we should be able to pick out readily five grades or degrees of tone, from the highest lights, which are accentuated on the upper corner of the forehead, over the eyebrows, over the cheek-bone, and on the bridge and end of the nose, to the very deepest touches of shadow under the eyebrows, under the nose, and about the mouth. These latter are the portions that remain clear in development, and in the old wet-plate days were represented by clear glass in the negative.

In conclusion, I have not said anything about the practical details of arrangement of skylight, its accessories, or posing, because my remarks are intended for those who are supposed to be well versed by actual experience in these matters, are working on a high standard of excellence, and are aiming to bring forth still better work. With all such I am in full sympathy, and, at a future time, will hope to offer some remarks about the very important matter of being able to secure the number of delicate gradations of tone, from high-light to deep shadow, of which I have spoken. It is a matter of emulsion, timing, and development. Unfortunately, the emulsion or brand of plate is not entirely under the control of the general photographer. It is a matter of the best success of the best makers. The development, owing to the difficulty of obtaining absolute equality, is not as satisfactory yet as we will hope it may become, and the timing—well, we all know the difficulty. It is a matter of good judgment and hourly experience.—*American Journal of Photography.*

---

Photo-Mechanical Specimens.—We have received from Messrs. H. Webber and Sons, of Kirkdale Road, Leytonstone, Essex, a fine series of collotypes, including portraits, landscapes, interiors, trade samples, machinery, and copies of old engravings, all of which are well rendered, and indicative of a considerable amount of skill in the working of the collographic processes. They are printed in inks varied according to the character of the subject to be represented.

Antiquity of the Electric Light.—Those who suppose the electric light to be a production of the present decade will be able to correct their apprehension of the subject after reading the following item from the *Scientific American*, December 9th, 1848:—"*New Electrical Light.*—The inventors of a new electrical light, exhibited at the Western Literary Institution, Leicester Square, London, on its recent reopening under the new auspices, expect, it is said, to apply it generally to shop and street illumination, and they state that, while the conveying will cost no more than gas, the expense of illumination will be one-twelfth the price of the latter light. The current of electricity, in passing through the two pieces of charcoal which form the poles of the circuit, and are excluded from all access of air, gives, in this case, it is said, an intense and beautiful white light, with the effect of daylight to a much greater extent than the lime does, and having this advantage, that it is sustained and continuous. If Messrs. Staite and Petrie can thus produce a steady and sustained light they have accomplished what has hitherto been the sole preventive to the substitution of galvanism for gas. The *Mechanics' Magazine* states that this one light completely eclipsed ten gas lights and an oxyhydrogen. The gas companies had better look out. The dissatisfaction of the public with their mismanagement may have begotten a rival destined to eclipse many more than merely ten of their gas lights."

## Notes.

The great progress that has been made in the methods by which rapid movements can be analysed is well seen in a series of photographs lately taken by Anschütz, of Lissa, who has already given to the world some of the best instantaneous pictures ever taken. The subject of the pictures at present under consideration is a dog jumping over a small bush. In the act of making one jump the animal has been photographed twenty-four separate times, and each picture is not a mere silhouette, as was the case with Muybridge's first attempts of this kind, but a little picture showing half-tone and detail. Some of the attitudes are, of course, comic in appearance, for they represent phases of a movement which the eye is unaccustomed to, and cannot possibly appreciate. Notably is this the case in the commencement of the jump, when the dog's hind toes only touch the ground; and again at the finish of the jump, when his legs are gathered together in a heap.

In spite of the greater facilities for patenting inventions in the United States, the number of specifications relating to photography are very few in comparison with those taken out and paid for at so much greater cost at the English Patent Office. What is the reason of this? We fancy that the answer to this question must be found in the circumstance that, in America, the small fee charged Includes the expense of a search through existing specifications, so that no "notion" can receive protection more than once. In the old country, on the other hand, the same idea is patented over and over again, and the heavy fees are taken each time by the authorities without a blush. It is a pity that personal morality and the official variety are such extremely different things.

Photographers who have the misfortune to have pictures left on their hands, or returned to them, cannot surely be many in number, for prepayment is, or should be, the invariable rule. But still, there may be some who are victimised, and they will doubtless be glad to hear of a plan for getting rid of their surplus stock. We must confess that the method is entirely new to us, but it is said to work well, and, like any other formula, it may be worth a trial. It consists in placing a placard in the gallery labelled "Misfit photographs for sale."

We have heard of misfit clothes, misfit boots, and misfit carpets, but a misfit photograph is quite a curiosity. Yet we have the assurance of a writer in *Chambers's Journal* that the inscription quoted above appears over a certain photographic gallery, and that it brings many customers. "Mothers, for instance, who have little children, often buy pictures of children with long hair when the hair of their loved ones hasn't grown, and send them round to friends at a distance. Brides' photographs are also said to sell very well." We are not told what is done with the brides' portraits, but possibly they too are used for the purpose of gammoning friends at a distance. But who is the wily photographer who does these things? We are almost tempted to believe that "there aint no sich pusson."

American lady tourists have invested the passage across the Atlantic with a new terror. Prince George of Greece, it seems, during his journey from New York, was pursued by 150 ladies, all armed with cameras, who persisted in photographing him, despite his protests and his attempts to cover his face. This is really a social nuisance, which ought to be sternly repressed. Celebrities are, of course. the chief victims; but should the fashion spread, no one on his or her travels will be safe. An announcement of "no photographing allowed abaft the funnel" would enable the victims to promenade in peace; but who can effectually guard against the pertinacity of a lady photographer?

The letter of a correspondent of the *Optician*, commenting on the system of advertising ordinary spectacle lenses as articles of special and peculiar excellence, reminds us of the hundreds and hundreds of worthless photographic lenses which at the present moment must be in existence, to the plague of the unfortunate amateur who is unlucky enough to buy one. These useless pieces of glass are usually to be found on the dusty shelves of the pawnbroker's shop, and the only thing which can be said of them is that the longer they remain there the better. In the early days of photography the market was flooded with common French lenses, most of which were incapable of producing a decent picture, but amongst which, occasionally, was one with marvellous powers. It was, of course, quite a matter of chance, but the mischief was that the rash amateur, hoping to get a prize on the cheap, often wasted his money. The general opinion now is, that if you buy a nameless lens you may pick up a bargain, but that if you buy one of an accredited maker you are certain to get your money's worth, even though you may pay a long price.

The Transvaal Mining Conference now sitting at Prætoria is in sad need of a photographer. An application about to come before the Transvaal Parliament for the sole rights of manufacturing cyanide of potassium was hotly discussed by the Conference, the chairman denouncing the application as an "iniquitous" one, while others were as strongly in favour of it because the granting of other concessions had turned out well. Ultimately the matter was postponed, in order that the members of the Conference might find out what cyanide is!

The view-finder attached to most detective cameras has suggested to the captain of a French man-of-war a means of sighting and firing guns with accuracy and, as far as possible, safety. On the cannon is fixed what is virtually a camera having a thick ground glass, upon which is marked a sight; over the cannon, in the side of the ship, is a small hole containing a simple lens. This is the whole of the apparatus. The gun is moved until the object to be fired at is seen on the ground glass, and this accomplished, the gun is fired. The name given to this method is *Tir Optique*, and its efficiency is said to have been amply proved by practical experiments.

The oddest photographic craze that we know is that of a worthy and respected collector of old armour who has had himself photographed in every suit, and as the collection is extremely varied, the photographic album which has resulted is one of the most curious which can be imagined. A wicked friend has maliciously said that he looks best in a helmet with the vizor *closed*. The foible is a harmless one, and we do not see why it should not be indulged in if it pleases the collector. The armour certainly gains by the process, because the wearer is able to throw a little animation into what would otherwise be a lifeless figure.

## SPHERICAL ABERRATION, DIFFUSION OF FOCUS, ETC.

BY W. K. BURTON, JAPAN.

I fear that your readers must, for the most part, be very sick of the subject of diffusion of focus, but I hope that they will have patience with me for a little if I bring the matter up once more, and I think it is but justice that the editor should let me say a few words in connection with a communication that appeared in the Photographic News by Mr. T. R. Dallmeyer, now a good many months ago.

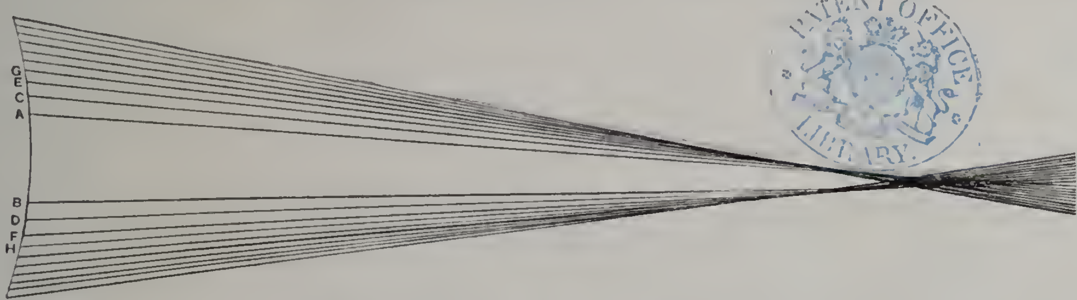
The circumstances were these. Perhaps I ventured on unsafe ground in criticising certain utterances of Mr. Dallmeyer's anent diffusion of focus. I have now to admit, at all events, with all candour, that at the time I wrote I had not thoroughly understood Mr. Dallmeyer. I hope to be able to show that I had not entirely failed to understand the subject,* as Mr. Dallmeyer generously stated at the time. Immediately I read Mr. Dallmeyer's communication I wrote to him saying that I had begun a set of farther investigations of the subject, and intended to write about the results later on. I did so begin, and had nearly finished what I had set myself to do, when my work was interrupted by an occurrence which, as it was of an entirely personal nature, need not be farther spoken of here. It is only within the last little time that I have been able to gather up the threads of the work again.

$\sqrt{5}$, &c. I have not yet noticed that Mr. Dallmeyer acknowledged this correction.

Even the axial line shown by Mr. Debenham in his diagram accompanying the above-mentioned communication should, I consider, be left out, as it gives the impression that there is 50 per cent. more of light enclosed within the limits of the smallest cone than there really is.

The drawing that I send is within the ordinary limits of hand drawing, and, allowing for the thickness of line necessary to permit of reproduction, a correct representation of spherical aberration, the lines representing the boundaries of cones, the diameters of whose bases are as 1, $\sqrt{2}$, $\sqrt{3}$, $\sqrt{4}$, . . . . . . $\sqrt{10}$. This drawing shows very distinctly the greater diameter of the cone of light at a given distance behind the plane of average focus representing the *distance* when a near object is focussed. It also shows not only the smaller diameter of the cone at a like distance in front of the plane of chief focus (representing the foreground), but shows the comparative definiteness of the boundary of this part of the cone.

But Mr. Dallmeyer's contention now is, that there is inward concentration behind the plane of average focus, and it may be said that even this drawing shows distinct inward concentration. I do not deny the appearance of such concentration, nor absolutely the existence, but I suspect that the appearance is produced more from the fact that the lines near the axis are nearly parallel before and after they intersect behind the average focus, whereas






they cross at considerable angles in front of the focus, than because of much real central concentration. At any rate, I tried to find some other measure of central concentration than the mere appearance of a diagram, however correctly drawn—not that I by any means despise such—and it seemed to me that a fair measure would be the intensity of the light on the axis of the lens, at different distances from the lens between that point where the central rays intersect, and that where the extreme marginal rays intersect. This intensity, again, can be measured by finding the length, along the axis of the lens (where that axis is the focus of a point formed by the intersection of rays from different annuli of the lens), through which the light from annuli of the lens of equal areas crosses the axis.

Mr. Dallmeyer, in the first part of the communication referred to, regrets that we live so far apart, that it is difficult to carry on a discussion. He is right so far. It is not possible to carry on a discussion with any satisfaction when several months must elapse between the printing of any two communications, and this even if the language used is always temperate. For this reason I propose to discuss no farther, but, in this communication, to give merely the result of certain experiments and calculations, letting anyone who likes draw his own conclusions.

In the first place, although we have had so many drawings representing spherical aberration already, I wish to bring one more before your readers. It was drawn long before I saw the article by Mr. W. E. Debenham, appearing in the Photographic News for September 19th, 1890, in which he pointed out that it is not a fair representation of the concentration, or otherwise, of light, where there is spherical aberration, to draw lines representing cones of light, the *diameters* of the bases increasing by equal increments. The *areas* of the bases should increase by equal increments. That is to say, that diameters of these bases should be not as 1, 2, 3, 4, 5, &c., but as 1, $\sqrt{2}$, $\sqrt{3}$, $\sqrt{4}$,

Thus, referring to the diagram, we take diameters *ab*, *cd*, *ef*, *gh*, &c., having the ratios 1, $\sqrt{2}$, $\sqrt{3}$, $\sqrt{4}$, &c., and calculate mathematically the distance between the two points where the lines from *a* and *b* intersect each other, and that where the lines from *b* and *c* intersect each other, then do the same for the point where the lines from *b* and *c* intersect each other, and that where the lines from *d* and *e* intersect each other, and so on. These are calculable without much difficulty by trigonometry, assuming a certain index of refraction. If the distance becomes less from without inwards (from a greater to a

* I have lost the number of the Photographic News containing the first part of Mr. Dallmeyer's answer to my communication, and cannot, therefore, quote exact words.

less distance from the lens), the brightness of the axis of the leus is greater within the average focus than without. If the distance becomes greater from without inwards, the brightness of the axis of the lens is greater without thau within the average focus. Working this out with all due care, I find that, for auy amount of spherical aberration at all likely to be used in practice, or even for much more, there is no appreciable differeuce in the brightness of the points on the axis of the leus betweeu the point where the extreme central rays intersect, and that where the extreme marginal rays intersect. It has to be admitted that, if we consider the case of violent spherical aberration, there is a slightly greater illumination of the axis without the average focus than within. Thus, with the enormous spherical aberration given by a plano-convex lens with an opening of one-third its focal length, the iutensity of the light may be greater by about ten per cent. for the point where the central rays intersect, than for that where the marginal rays cross. With any spherical aberration useful in practice, however, the illumination of the axis between the two points just mentioned is so uuiform that any difference there is in brightness between the extremes, if worked out, only shows in the third or fourth decimal figure. The deduction from these calculations being that, so far as brilliancy of light along the axis of the lens between the point where the central rays intersect, and that where the marginal rays intersect, may be taken as a measure of concentration of light; the concentration is equal between the two points. I thought it best to make a set of actual experiments, with a lens having adjustable spherical aberratiou, using more care thau I had in any previous set of experiments. The lens used was J. H. Dallmeyer's "4A Patent" lens—to be quite exact, No. 42,020. All the experiments involving spherical aberration were made with the back cell unscrewed as far as possible.

A few rough preliminiary trials were made, and then the first definite experiment was made in the following manner:—Opposite to the camera, and at a distance of some twenty yards, there was fixed a white stake. At distances in front and behind this (just so far off line that all might be visible) were fixed two other stakes at distances *equivalent* to equal distances behind and in front of the focus of the lens when focussed for the middle stake. (Mr. Dallmeyer, in his communication to the Photographic News, already referred to, assumes—somewhat unnecessarily, I think—that I do not know that such equivalent distances will not be equal; that, in the case under consideration, for example, the distance between the middle stake and the nearer one will be less than the distance between the middle stake and the farther one.) On each stake there were painted circular discs in black of different sizes. The middle stake was focussed for, the back cell of the lens being fully screwed home. The want of definition in the case of the other two stakes was now naturally equal. The cell was then unscrewed to its limit, the middle stake was again focussed for, and the result was observed as well as possible. It seemed in this case that, whereas the definition was distinctly worse than before in the case of the more distant post, it was, if anything, better in the case of the nearer. This result was, so far as the farther stake was concerned, distinctly confirmed by exposing plates, and this *especially if the exposures were fairly ample.* In such cases the black discs sometimes entirely disappeared, whilst they were quite distinct in the case of the nearer stake, and did not disappear with the same exposures, using the lens without spherical aberration, and focussed for the middle stake.

This experiment is not by any means so conclusive as it would appear to be, for oue of the first things that I discovered was that, working in this way, *it would be very easy to prove anything that I wanted to prove*, because of the uncertainty of focussing when a considerable amount of spherical aberration is introduced. Doing one's level best, there are limits some distance apart between which oue is doubtful where to focus; thus, focussing once, marking the place of focus, putting the image out of focus, aud focussing once again, the chances are, that there will be a very appreciable difference of distance between the two planes focussed for. Again, I found that there is a tendency to focus for different planes for different kinds of subjects even at the same distance; thus, there is a tendency to focus in two different planes at some distance apart for two differeut subjects, one of which is of the nature of dark spots on a white ground, the other of which is of the nature of light spots on a dark ground.

The thing, however, brought out by this part of the investigation which I consider most curious is, that there seems to be a *personal equation* in the matter; thus, placing a well-defined object opposite to the camera, whilst the back cell was fully unscrewed to give maximum aberration, aud asking differeut people—noue of whom knew auything of the object of the experiments—to focus (always racking the lens quite out of focus after an experiment was finished) it was found that one person would incline to focus farther forwards or backwards than another. No one of them would always focus for exactly the same plane, but the average focussing of one would always be farther forwards or backwards than that of the other.

Seeing, then, the absolute unreliableness of experiments in which one trusts to trial alone as to what plane to focus for with a lens exhibiting spherical aberration, I considered it advisable to find some more definite way of focussing, and, after some consideration, I came to the conclusion that it would be fair to focus for a plane situated half way between that in which the central rays intersect, and that in which the marginal rays intersect. To discover the position of this plane, an opaque disc was prepared, a little less in diameter than the leus; it was fixed in front of the front combination, and a large lamp flame at a distance of about twenty feet was focussed. The disc was then removed, and there was inserted the smallest diaphragm that would allow of decisive focussing. The result was that it was found necessary to rack the lens just about one-third of an inch farther from the lens to get the image sharp. The effect was then tried of racking the lens equal distances forward and backward of the plane half way between these two. The result was that the flame distinctly retained a fairly well-defined outline for a greater distance racking forwards (bringing the plane of focus nearer to the lens) than racking backwards. Forward racking represents foreground, backward racking distance. These results were corroborated by taking photographs of the flame. The destruction of the form of the flame behind the average focus, when the lens was racked forwards, was particularly emphasised if the exposure was somewhat prolonged.

Another experiment here suggested itself. For the lamp flame—that of a lamp with a large circular wick, and a flame-spreader, giving a flame about three inches in diameter—there was substituted an "artificial star" made by replacing the lamp flame by the bulb of a mercurial thermometer, illuminated by a side light at some distance, and not visible from the camera. Here the result was quite different. In racking the lens away from the ground glass, the point of light was still represented by a spot of almost inappreciable diameter, which, however, had a halo of rapidly increasing diameter around it. In racking in, on the other hand, the point of light very soon assumed the form of a small, distinctly defined ring of light. This is, I believe, quite in accordance with what is observed in using, for purposes of stellar photography, telescopes whose objectives exhibit spherical aberration. Also there is explained, unless I am mistaken, why, in the case of a large mass of light like the lamp flame, or a black disc of considerable size on a white ground, the form of the outline of the object does not become much blurred in racking inwards for some considerable distance. The size of the object is much larger than the diameter of a ring of light representing a point, and the infinite number of small rings of light forming the edge of the image overlap, and there is formed a well-defined edge, only making the whole image a little larger than it should be if it is bright on a dark ground, smaller if it is dark on a light ground.

I may mention that I got several different people to focus for both the lamp and the artificial star, and that, in the case of the lamp flame, some focussed for very nearly the extreme outward plane of focus, some for nearly the extreme inward plane. In the case of the "artificial star" there was also considerable difference, but not so much as in the case of the lamp flame. None of them knew for what reason I asked them to focus.

I do not give these results as conclusively proving anything definite, and, as I have said, I avoid any description of the conclusions that I draw from them myself. Anyone else may draw his own deductions. I think, at any rate, they show that we have not yet got completely to the bottom of the subject, and that more might be said about it were not all mankind that have heard the name of it, probably most heartily sick of it by this time.

There was one entirely different point in connection with which I expressed difference of opinion from Mr. Dallmeyer. If I understand him properly, he holds—in accordance with Emerson's originally expressed views—that no plane in a photograph should be rendered as sharp as a photographic lens can render it, and this not on account of the mere expression of opinion of artists on the matter, but as a scientific fact based on the assumption that a good photographic lens defines better than the human eye, and that, therefore, there will be made visible by it, in a photograph, detail invisible to the eye. I protested against this doctrine on the ground that, whatever failing there may be in the defining power of the eye when viewing objects, there will be exactly the same failing in viewing a photographic image of them, even assuming the definition of the lens to be *absolute*. I do not know whether Mr. Dallmeyer holds the same position as before in respect to this matter, or rather whether he holds it absolutely. In his last communication to the Photographic News in reply to me on the subject, he says: "Mr. Burton's contention *seems** unsound, for the following reasons. First, in viewing any landscape or subject, the retina of the eye is more or less flooded with a diffused light; in the case of a camera with a well stopped-down lens there is comparatively no diffused light to interfere with the powerful discriminating focus that registers the image. Then in viewing any object we have *binocular vision*. Binocular vision is, in one sense, of use only up to a certain distance, but is a very powerful means of discriminating for near planes. I believe that I have normal vision, and I can distinctly see print using two eyes at a greater distance than is possible with one."

* The italics are mine.—W. K. B.

So far as diffused light is concerned, I would ask if it does not enter the eye in viewing the photograph as well as in viewing the "subject?" In fact, is the photograph itself not a "subject" when it is being looked at? In any case, this is a matter easily determined by experiment. Let a sheet of printed matter, or a set of the test letters that oculists use, be placed in good light, and at such a distance that some of the matter—that in the larger type —can be read, whilst some cannot. Let it now be focussed with any lens and any stop, the optical centre of the lens being the same distance from the printed matter that the eye was: let a photograph be taken of it, and see if, in a similar light, and looking at the photograph from a distance equal to the focal length of the lens at the time the photograph was taken—the lesser conjugate focus, more correctly—anything can be read that could not be read before. Of course, binocular vision will be used in looking both at the original printed matter and at the photograph of it. All that I can say is, that I have never found a Dallmeyer lens that had the power (I suppose Mr. Dallmeyer would not consider other lenses a better test), and I shall consider it a miracle when I do find any lens that has. I am writing of definition in one plane only, be it distinctly understood.

## ON SOME MODIFICATIONS OF EIKONOGEN AND HYDROQUINONE DEVELOPERS CONTAINING BORAX, CARBONATE OF LITHIA, ETC.

BY COLONEL J. WATERHOUSE, S.C.

In the October number of the *Journal*, attention was briefly drawn to a new eikonogen developer called *graphol*, the distinguishing features of which were its being self-contained, only requiring solution in water to be ready for use, and borax being the principal alkaline agent. Some further particulars regarding this developer, and of the action of borax, carbonate of lithia, sugar of milk, and some other substances in the eikonogen and hydroquinone developers may be of interest.

The sample of *graphol* was received in Calcutta about the middle of September, at a time when the temperature was high and the air saturated with moisture. It remained quite dry and fairly white for some time, but at the end of six weeks had discoloured to a dark mouse colour, and formed a very dark green solution, whereas, at first, the solution was of a bright yellow or emerald green. It did not, however, at that time seem to have lost its developing power in any very sensible degree. In January it was darker in colour, but still developed well, though it had lost some of its power, and longer exposures were necessary. It had thus kept four months in good condition in a corked bottle, though opened at the worst time of the year. Under favourable conditions it would most probably keep much longer, and it seems likely to prove a useful developer for general purposes, but especially for travelling. Used solutions of it turn brown on keeping, and from this and other indications it seems probable that hydroquinone forms one of the ingredients.

An attempt to make a *graphol* developer by grinding together eikonogen, metabisulphite of potash, borax, hydroquinone, and sugar of milk was not successful.

The mixture, when fresh, worked very well, but very soon darkened, forming a dark brown solution, which had far less developing power than the fresh mixture.

As noticed in my former paper referred to, M. Mercier states that *graphol* contains, among other ingredients besides eikonogen, borax, sugar of milk, and carbonate of lithia. Some experiments were therefore made with eikonogen developers containing these substances, but chiefly in the laboratory, and not by actual practice out of doors.

With regard to the peculiar action of borax—in some cases as an acid, and in others as an alkali—Monsieur Mercier refers to two notes by Monsieur Aug. Lambert, on the action of borax on the polyatomic alcohols, and on the polyatomic phenols, which were published in the *Comptes Rendus* of the French Academy of Sciences (Vol. 108, No. 19, May, 1889). In these notes, Monsieur Lambert states the results of some experiments made in verification of Klein's observation that mannite, glycerine, erythrite, dextrose, lævulose, and galactose, had an acid reaction with borax, while the polyglucosides, including saccharose (cane sugar), lactose (sugar of milk), and quercite did not do so, and he further shows that pyrogallic acid, pyrocatechin, the alkaline gallates and tannates, and other polyatomic phenols of the orthi series behave similarly to glycerine and the mannites, and give an acid reaction to borax by the formation of monoborate of soda and an acid boro-compound capable of decomposing carbonates. This reaction is not shown by orcin, resorcin, and hydroquinone, which belong to the meta or para series, and Monsieur Mercier has discovered that it is also not shown by eikonogen.

Boric acid had already been tried by the writer as a possible preservative of eikonogen, but it was not found altogether satisfactory. Trials with borax have, however, shown that, as stated by Monsieur Mercier, it may replace the caustic alkalies and their carbonates in the eikonogen developer, and has the advantage in a hot, moist, tropical climate, at any rate, of being a definite and quite stable salt, whilst carbonate of soda, which is usually recommended for use with eikonogen, is a somewhat indefinite, and, in its crystalline form, a very unstable salt, being readily deliquescent, and apt to melt in its water of crystallisation. Carbonate of potash, though more definite and stable than the soda salt, is also very deliquescent.

For ordinary work, borax seems to answer very well with eikonogen in combination with sodium sulphite; the solution changes very little in colour, and several plates can be developed successively in the same solution, though more time is required for development in the used solution. The lights are clear and free from stain, and there is a good intensity of image. The following formula has been found to answer well, but should be modified as found desirable with different makes of plates or different classes of work:—

| | |
|---|---|
| Eikonogen ... ... ... ... | 1 part |
| Sodium sulphite ... ... ... ... | 2 parts |
| Borax ... ... ... ... ... | 2 ,, |
| Water ... ... ... ... ... | 100 ,, |

For instantaneous work a more powerful developer would probably be necessary.

Eikonogen with borax alone, without sulphite, in the same proportions as above, forms a strong developer, but the solution soon discolours and loses power.

Hydroquinone also with borax alone does not answer well as a developer; it gives weak images and is liable to stain the film, but, with the addition of sodium sulphite, it gives pictures with good density and detail, does not stain the film, nor does the solution readily discolour.

A mixture of eikonogen, hydroquinone, borax, and sodium sulphite forms a good developer, but the best proportions have not been fixed. The addition of hydroquinone adds considerably to the density of the image, as noted already by other workers. The formula given above, with half to one part per cent. of hydroquinone, has been found to work well, but may also be modified as required.

Carbonate of lithia, which is said to be one of the ingredients of graphol, though it could not be detected with the spectroscope, seems likely to be a very useful substitute for other alkalies. Its stability and definite composition as compared with other alkaline carbonates are a great advantage in an Indian climate. It certainly acts well in the eikonogen developer, giving density and detail without hardness, and in this respect, quantity for quantity, is better than borax. It is, however, only very slightly soluble in water, a saturated solution taking up only about one per cent. of the salt, or barely five grains to the ounce.

It also works very well with hydroquinone, making a very excellent developer for ordinary work, and instantaneous pictures may be made with a mixture of eikonogen, hydroquinone, carbonate of lithia, and sodium sulphite in about the same proportions as given above, but substituting carbonate of lithia for the borax. In some cases it has been found convenient to keep the carbonate of lithia in saturated solution, and add the other salts to it.

Sugar of milk (lactose) seems to be also a useful addition; it increases density and detail in the eikonogen developer. With hydroquinone and eikonogen and borax it was found to give excessive density. As noted by Lambert, lactose does not form an acid compound with borax.

I hoped to have been able to have tried experiments with various other sugars, but they did not arrive in time to be tried before I left Calcutta.

It may be noted, however, that Fahlberg's saccharin, which is not a sugar at all, seems to have some effect in increasing the stability of the ordinary eikonogen developer made up with sodium sulphite and carbonate, but with borax it seems to act rather as a restrainer.

Pyrogallic acid will not work at all as a developer with borax, nor will hydroxylamine hydrochlorate.

It may be noted, too, that the new white eikonogen in powder seems to be a great improvement on the old form of this salt. It certainly keeps its colour very much longer, though, after being open for a short time, black specks appear. It evidently contains a sulphite, but requires the further addition of sodium sulphite to work effectively.

*S. S. Chusan, Aden, May 21st.*

Cement for Parchment Paper.—The best cement for pasting parchment paper, according to a lithographic authority, is casein glue. It is much better than so-called chrome glue, because the latter produces yellow or brownish spots where it has been employed. Casein glue is a solution of casein, which appears as whey or drop when milk is allowed to curdle. The glue is dissolved in a saturated solution of borax. When dried in the form of transparent gelatine it appears as greyish white and somewhat brittle matter, which can be easily dissolved in water, and possesses great adhesiveness. When employed for pasting parchment paper a thin paste is prepared, used in the customary manner, and the jointed places afterwards exposed for a little while to a jet of steam.

## PERMANENT PRINTS.*

BY BROWN SLICK.

THE first thing to be settled is, whether there is such a thing as permanency in prints. The battle between platinotypes and bromides has been generally admitted to be a draw; neither side has been proved to be vanquished. It therefore remains for time alone to prove which will last the longest under ordinary circumstances. Platinotypes are usually credited with having most chance of lasting, but hanging in the Club-room may be seen a good specimen of a print which has now been out here for some years, which has not lost anything to speak of in the strength of the blacks—but what about the whites? They have (like every other photograph in India sooner or later does) lost their purity, and if examined in a good light will be found to have turned quite yellow. So far, my experience with bromides has been that they keep out here quite as well as platinotypes, and until a few days ago I had nothing but the highest opinion of them. Alas! not so to-day.

In the summer of 1890, while in England, I printed a quantity of bromides and platinotypes, and spared no trouble to wash them perfectly with a view to keeping them in India. Some I mounted in a book, and the rest were mounted on cards for framing. Seven months only have gone, which anyone will admit is no test at all, but, unfortunately, quite enough to seal the fate of three bromides. On turning over the pages of my book, I found to my dismay that, where a bromide print faced a platinotype, it had (I mean, of course, the bromide) turned quite brown, and was vanishing into clear white paper. Turning over a few more pages I found the same thing again, and it turned out that wherever a bromide and platinotype came face to face it was all up with the bromide, while in no case has a platinotype suffered in the least. Of course the first answer to this is that there must be some acid left in the platinotypes which acts chemically on the silver of the bromides. Well and good; but it is very poor fun if we are to keep different books for every different sort of print. There is, however, one point about my faded bromides which hardly bears out the acid theory. If there is acid left in the prints the whole of the picture in bromide ought to fade away. Not so, however; the black of the bromide only disappears where it comes in actual contact with the actual black of the platinotype, and I am more inclined to think it is more of a galvanic action between the silver and the platinum.

The bromides mounted on cards and frames have not deteriorated in the least, so that it is not likely that my manipulation was at fault.

---

THE Art Colour Photographic Company invited, last week, several gentlemen interested in photography to a banquet at the Hotel Métropôle, at which numerous examples of pictures produced by their patented process were exhibited. We understand that nearly all the shares in this Company have already been taken up, and that very soon active operations will be commenced.

WE have received from Messrs. Morley and Cooper, of 70, Upper Street, Islington (North London Photographic Stores), their copiously illustrated catalogue. We have carefully looked through this useful little book, and can truly say that nothing essential to the practice of photography is omitted from it. As an example of its variety, we may mention that no fewer than ten different forms of dark room lamps are here described and illustrated.

* Abstract from *The Journal of the Photographic Society of India.*

# Patent Intelligence.

### Applications for Letters Patent.

12,262. HERBERT JOHN ALLISON, 52, Chancery Lane, London, "Improvements in Picture Frames." (Solomon P. Stoddard, United States.)—July 20th.

12,374. WILLIAM FORD STANLEY, 28, Hatton Garden, London, "Improvements in Portable Photographic Apparatus Adapted to Take Views."—July 20th.

12,408. WILLIAM ACKLAND, 18, Fulham Place, Paddington, London, "An Improved Apparatus for Registering Photographs, Applicable to Film Photograph Roll Holders."—July 22nd.

12,527. WALTER O'REILLY, 97, Newgate Street, London, "Improvements in and Connected with Magazine Photographic Cameras."—July 23rd.

12,531. DESIRE BOUCHARD, 35, Southampton Buildings, London, "A New or Improved Apparatus for Producing Pictures upon a Screen in Stereoscopic Relief by Means of Electricity."—July 23rd.

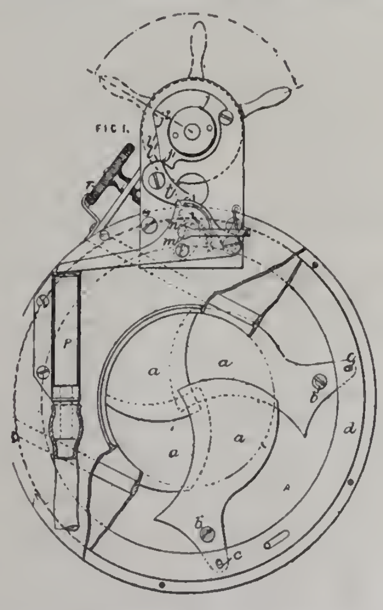
### Specifications Published.

2,628. *February 18th*, 1890.—"Magnesium Flash Lights." A. J. BOULT, 323, High Holborn, Middlesex. (C. Lansiaux and C. Merville, 42, Boulevard Bonne Nouvelle, Paris.)

Relates to apparatus for producing flash-lights for photographic, &c., purposes. The magnesium powder, which is filled into a box through an aperture in the top, falls into a tube through a slit or opening. It is ejected to a lighted fusee, &c., by a pneumatic ball, a finely perforated nozzle preventing the return of the powder to the ball.

2,776. *February 20th*, 1890.—"Lens Shutters." F. BISHOP, 22, Soho Square, Middlesex.—(Voigtländer and Son, Brunswick, Germany.)

Four steel segments or plates *a* are pivoted at *b* to a hollow annular frame A, and are actuated by a ring *d*, which is connected with the tails of the segments by studs C, which engage



in slots therein. The segments, which thus form a shutter of "iris" type, are adapted on being opened and closed to admit and shut off the light almost simultaneously over the whole aperture. The ring *d* is actuated by a crank on a spring barrel to which a plate J, having stops $J^1$, $J^2$, is attached, the one corresponding with the "set" position of the shutter, and the other with the open position. The stops abut against the shoulder $l^1$ of a pivoted lever *l*, which is actuated by an escapement lever *n* on a lever *m*, controlled by a pneumatic arrangement P. The lever *n* is regulated by a cam, so that when it is desired to hold the shutter open for a certain time, the stop $J^2$ is, on the stop J¹ being released, arrested by the shoulder $l^1$. The spring actuating barrel is controlled by a brake arrangement, which is regulated by a micrometer indicator screw *r*, for further regulating the time of exposure. When compound lenses are used the shutter is placed between.

2,671. *February 19th*, 1890.—"Photometry." W. Foster, 14, Clement's Inn, London.

The apparatus is intended for examining the light given by different forms of burners or by different gases with special burners. On a plug having one lateral passage, rotates a series of radial arms, at the end of which burners are placed. Any of the burners may thus be brought into use, the corresponding arm being then in the same straight line with, or parallel to, the bar of the photometer. When the burner is flat-flame, the plug has a groove all round it, supplying gas through lateral apertures, so that the burner can be turned into any required position by a milled head, without altering the supply. The arrangement of the parts may be modified.

2,814. *February 21st*, 1890.—"Mitre Cramps." E. Schievenbusch, Mastrichterstrasse 45, Cologne, Germany.

The sides of the picture frame, &c., to be united are cramped between an angle-piece, and pointed blades adjusted by a set-screw in the block. Either the block or the angle-piece is traversed on the frame by a screw which is rotated in suitable bearings by a handle, and engages with a nut fixed to the back of the movable part.

## Correspondence.

### GLASGOW AND WEST OF SCOTLAND INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

Sir,—I write to inform you that the special judges in the Photo-Mechanical Section of this Exhibition will be Mr. Robert Blackie, of Messrs. Blackie and Son, Ltd., and Mr. W. B. Blaikie, of Messrs. T. and A. Constable.

We have been very fortunate in securing the services of these gentlemen, who, in their connection with these large publishing firms, have acquired a very thorough knowledge of photo-mechanical methods of illustration. Mr. Blackie is also widely known as a highly competent art critic.

There is every indication that this section will be both large and interesting. Wm. Goodwin, *Hon. Sec.*

*Glasgow, July 25th.*

### PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Sir,—I beg to inform you that at a council meeting held to-day, Mr. George Davison has been elected president of the Convention for 1892. F. P. Cembrano, Hon. Sec.

10, *Cambridge Gardens, Richmond, Surrey, 29th July.*

The Photographic Club.—Subject for August 5th, "Dark Room Appliances and Photographic Dishes"; 12th, report of the delegates to the Convention. Bank Holiday outing at Penshurst; train from Charing Cross at 9.28, London Bridge at 9.35; does not stop at Cannon Street.

Borax in Developing Solutions.—The addition of borax to developing solutions has often been noticed to retard development, yet borax is distinctly alkaline. The apparent anomaly has been explained by M. Aug. Lambert, who calls attention to the well-known fact that borax reacts with the polyhydric alcohols, liberating boric acid. The same thing takes place with pyrogallol and hydroquinone. Thus, borax added in small quantities to pyrogallol converts it into a true acid which reddens litmus. It is the same with tannin and pyrocatechin, so that with these substances the addition of an alkaline borate is equivalent to the addition of an acid, the salt in this case causing retardation. But this reaction is not produced with the isomers of pyrocatechin, *i.e.*, hydroquinone and resorcin. Neither is it produced with the ether-developing agents now in use. Here borax does not give rise to any acid, and acts merely by its alkalinity.

## Proceedings of Societies.

### Photographic Society of Great Britain.

At the technical meeting of this Society held on the 28th inst. Mr. W. Bedford occupied the chair.

It had been announced that the photographic optics and perspective would be discussed, and it was assumed that it was only optics as connected with perspective that was intended. The Chairman requested Messrs. Dallmeyer and Debenham to speak on the subject, and the latter said that photographic perspective had been attacked as other characteristics of photography had been attacked. It had been assumed by superior persons that if they could find any difference between photographic representation, and the ordinary, if not universal, representation of the painter, that photography must be wrong and condemned accordingly. As to the power of photography to render gradation in high-lights and deep shades, he would admit room for improvement, but when it was a question of form he believed that photography was right, and that any differences between its representations and those of the painter were due to the conventions by which the latter had been bound, conventions which photography had broken, and still was breaking, down. As for aerial perspective, that was imperfectly rendered, owing to the want of true gradation in the high-lights, to which he had before referred. The failure had, however, rather the effect of exaggerating than of weakening the loss of clearness in the distance characterising aerial perspective. As to linear perspective, he had recently expressed his views that there was no ground for the attack made upon it by Messrs. Emerson and Goodall. He thought there was no proof of their assumption that the upper and lower halves of the eye saw objects on a different scale. If, however, that were so, it would not affect the truth of mathematical, or—what was the same thing—photographic perspective, as the eye would enlarge or diminish the upper and lower parts of the picture as it was stated to do with the natural objects. It was not uncommon to hear it said that photography exaggerated the size of foreground objects. He thought that those who made such statements should show a complete scheme of what they would consider true perspective. It would be easy to draw any single foreground object smaller than it appeared in the photograph, but it would be at the expense of something else appearing larger. Let there be a complete circle of foreground objects at an equal distance from the point of sight, and then see how any one could be made smaller without enlarging others. He considered that artists had been much limited by conventions. One convention was to confine a perspective drawing to a limit of about sixty degrees. When, therefore, an interior had to be shown, or an exterior if so surrounded by buildings that a view of it could not be obtained within the limits of the conventional angle, it had been the custom to draw the lines as they would appear if the building were viewed at a greater distance than was actually possible. Here, however, in order to give a true representation of what would actually be seen at the assumed distance, not only the direction of the lines would have to be changed, but objects might come into view that at the point used for sketching from might be out of sight; and, on the other hand, objects actually seen by the draughtsman and the spectator might be hidden at the distance indicated by the direction of the lines. Photography was breaking down this as it had done other conventions. As an illustration, he would point to a cut in that day's *Daily Graphic*, where a portion of the interior of Westminster Abbey was shown. Compare the size of the side pillars and roof with the more distant part of the building, and it would be seen that it was in much such proportion as might be seen in a photograph. Photographic is true perspective. By photographic perspective he meant such as is given by a non-distorting lens or a pinhole on a vertical plate.

Mr. T. R. Dallmeyer thought that Mr. Debenham had totally mistaken the ideas of Messrs. Emerson and Goodall, although he could not say that he was altogether with them. He made a diagram on the blackboard showing the effect of binocular vision in the lateral displacement of objects not at the place to which the axes of the eyes were directed. All but one of the effects described by Messrs. Emerson and Goodall he could produce. He found the top of a door to appear wider than the bottom when his eyes were fixed steadily upon it. He found, however, that pillars to appear vertical should not, as they had stated, be inclined inwards at the top, but outwards, the reverse of their proposition. On Langham Church the extinguisher top was bulged to produce the effect required by the eye. There were four kinds of perspective. The aerial, and here Mr. Debenham made a mistake as to the effect of photography. Then there was the perspective of light and shade, by which, for instance, a round tower could be recognised as such. Then there was mathematical perspective, and he thought that artists too much ignored what they owed to mathematical perspective. In one of the papers, in a letter written against Emerson and Goodall, the example was given of a lamp-post appearing in the foreground of a photograph of St. Paul's Cathedral, and coming out too large to appear natural. An artist who sketched such a view would say: I won't stand here, but will fix my standpoint farther, and will draw the whole as it would appear from a greater distance. It was to be deplored that it was out of the power of photography to do this.

Mr. Debenham thought that the introduction of binocular vision was only calculated to confuse the question of perspective. Messrs. Emerson and Goodall had expressly denounced the accepted rules of monocular perspective, and, for clearness, he had confined himself to that issue. In any case, binocular vision did not affect the height of any object, and laterally its effect was, on the whole, to duplicate each object in both directions equally. He then drew on the blackboard a plan of the interior of the building, showing certain objects that would be seen at the greatest distance at which the camera and spectator could be placed. If, now, a draughtsman selected an imaginary standpoint, such as would be possible if the end wall of the building were removed, some objects actually visible from the inside standpoint would be hidden, and other objects not visible from the inside standpoint would come into view. Of some of these objects, the draughtsman could never have obtained a view at all from the spectator's position on the floor of the building. How, then, could he include them in his drawing? Merely altering the direction of the lines would not make the picture a true view of what would be seen at the distance indicated by such direction; there would have to be a change in many particulars.

Mr. G. L. Addenbrooke said that the rules of perspective would enable an artist to select his point of sight at whatever distance he thought proper, and make his drawing true for that distance. He was thus enabled to avoid exaggerating near objects.

Mr. Dallmeyer said that an artist would make drawings from two or three points of sight at different heights, so as to enable him to see what would be seen at the distance he assumed for his perspective drawing, and would combine them.

Mr. Debenham said that the artist would have to make not two or three, but many such drawings, and not only from different heights, but from different positions laterally, if he wanted a true representation of the subject as it would appear from the assumed distant standpoint, and then the picture would include something not visible from the standpoint of the spectator, and exclude others that he would see. Could that be a satisfactory representation?

Mr. Dallmeyer said that Mr. Debenham's remarks would only apply to interiors.

Mr. Debenham said that was not so. They were equally applicable to exteriors where there were surrounding buildings, or where, for other reasons, a distant standpoint including the whole subject was not accessible. Photographic perspective was true, and although the effect of wide-angle pictures was considered to exaggerate near marginal objects, he thought that that idea was wearing off as we became more accustomed to such representation. Short focus lenses had been blamed, but with no more reason than long focussed ones if the subject were photographed from the same place.

Mr. Dallmeyer would like to insist upon the effect of short focus lenses in giving an exaggerated idea of proportion.

Mr. Debenham maintained that the length of focus of the lens had nothing to do with it. The perspective and proportions were fixed by the selection of the standpoint.

Mr. A. Cowan could not admit that it would be right to alter the direction of the lines in a drawing so as to indicate a distant standpoint without at the same time altering the drawing itself by showing or removing such objects as would be shown or hidden at the distance indicated. If this were done, however, the picture of an interior would show what the spectator in the building could never see, and, consequently, could not be a true representation to him.

Mr. Dallmeyer said that from where he was he could see the heads of some members very near, and others at some distance. If this view were photographed with a short focussed lens the near heads would appear disproportionately large.

The Chairman said that that raised the physiological question of what appeared disproportionate because of our knowledge of real equality.

Mr. W. Bedford quite agreed with Mr. Debenham as to the marked change which photography has brought about in the treatment of subjects by artists. Pictures of mountain scenery by Turner, beautiful as they were, would not now be accepted as true renderings on account of the licenses taken with perspective. There had, however, been painters before photography who rendered architectural subject with the perspective such as given by photography; of these, he instanced Prout and David Roberts. He would say that if, as Mr. Dallmeyer contended, photography was a loser in not being able to paint a picture from an impossible standpoint, the advantage was a very doubtful one. It would be absurd to paint, say, the interior of a cathedral, showing as much subject as required to give a general idea of it, but in such perspective proportions as could only be seen from an impossible point of view.

Mr. E. Clifton, referring to the question of binocular vision, said that the most determined opponent of photographic perspective with whom he was acquainted was an artist who did not possess binocular vision, having only one eye.

Mr. J. G. Hudson showed a lamp for producing a continuous flash with magnesium powder, and a portrait of the Chairman was taken by its aid, an exposure of about two seconds being given.

## Hackney Photographic Society.

*July 23rd.*—Dr. Roland Smith in the chair.

The paper and demonstration for the evening was on "The Intensification of Silver Paper," by the Assistant Secretary. Prints were handed round showing the different colours obtainable by this process, which is that introduced by Mr. Lyonel Clark.

Saturday, July 25th, a pleasant afternoon was spent at Hampton Court.

## Bath Photographic Society.

On the 22nd inst. the members paid a second visit to the picturesque grounds at Prior Park. The Society is fortunate in having as an active member the President of the College, Canon Williams, an accomplished photographer, who takes a good deal of interest in photographic matters. The day was unfavourable for an outing, but occasional outbursts of sunshine facilitated the work of the party, and it seems that more pictures were obtained than during the visit of the Photographic Convention to the same place. At five o'clock tea was served in the Mansion, after which the party took leave of their hospitable host, and returned to the city.

## Richmond Camera Club.

*July 24th.*—Mr. Ardaseer in the chair.

Mr. Richardson showed a xylonite developing dish, and the Chairman Adams' lantern slide printing frame.

The subject for discussion was "Dark Rooms." Mr. Garrett described the Davenport portable dark room; Mr. Cembrano, a travelling dark room of black material, and like a mosquito net; Mr. Ramsay, an iron building by Boulton and Paul; Mr. Irvine, an old third-class railway carriage, which he had converted into a dark room and workshop. Other members described makeshifts for the purpose, and the Chairman gave a short account of his adaptation of a wooden shed at the side of his house.

The outing to Virginia Water duly came off on Saturday, and an enjoyable afternoon was spent by the three trippers.

---

Birmingham Photographic Society.

*July 23rd.*—At Midland Institute; Mr. W. Jerome Harrison, F.C.S., in the chair.

The Hon. Secretary brought before the meeting Mr. W. T. Stead's "Magic Lantern Mission." The hon. secretary of excursion committee (Mr. Mousley) read favourable reports of excursions made to Compton Winyates, Tamworth, Lapworth, and Packwood.

The question was asked, "What is the cause of black spots forming on negative films?"

The Chairman thought it might arise from either undissolved pyro or from using town water.

The Chairman then announced the business of the evening, viz., the exhibition of photo-survey prints of the county of Warwick. He hoped all would contribute to the survey, and help, if only by a little. They were workiug on the six-inch ordnance map, and should require an average of about fifteen to twenty-five prints from each member of the survey section. He regretted the weather had, so far, been so unsuitable, but was glad to see so many prints brought forward, and more so because this was merely a preliminary meeting and exhibition in the middle of the season.

The following, amongst others, showed pictures taken by them for the survey, and gave short accouuts of the places visited:—Messrs. J. T. Mousley, of Maxtoke Priory; J. Simkins, of Seccington, Newton Regis, &c.; T. Taylor, of Leake Wootton; E. Uuderwood, of Baddesley Clinton; A. J. Leeson, of Fillougley, Corley, Aston Hall, &c.; G. A. Thomason exhibited some of Packwood, &c.; the Chairman, who had a very large colleotion of prints, of Rowington, Tamworth, Lapworth, Temple Balsall, Coleshill, Knowle, Maxtoke Priory, and Compton Winyates, besides examples of the different means of present-day looomotiou, street scenes, &c.

The Secretary called attention to the next half-day excursion to Arley and Fillougley on August 8th.

---

Our French neighbours, as might be expected in the land which gave birth to Daguerre, possess a large number of photographic publications. An additional one has, however, just appeared. It is called *La Tribune Photographique*, aud will be published on the 1st aud 15th of each month. The first number is now before us. It contains an illustrated article on the various applications of photography, an account of Edison's kinetograph, and other items of interest. It contains 16 pages of matter, and its price is 30 centimes.

Photographic Perspective.—Very few photographs of landscapes are correct in perspective. Mr. A. Mallock has been discussing in *Nature* the optical factors which determine this, and, in the course of his article, he says that any photograph taken with a lens of less than about a foot focal length must exaggerate all the distances or make objects in the picture look smaller than they should. The only remedy for this, in his opinion, is to enlarge the picture until the right distance to view it from becomes also the convenient distance. Even if this be done, however, there is still a tendency to view the picture too far off; for few leuses, except those for portraits, embrace an angle so small as to be taken in at a siugle glance, and people are naturally inclined to stand far enough from a picture to see the whole of it at once. Still, a proper amount of enlargement offers the best means of making a photograph give a true idea of the scene which it represents; and this is especially true of the small pictures taken by so-called "detective" cameras, having lenses varying from four to six inches in focal length; and it is for this end, and uot, in general, to enable more detail to be seen, that the enlarging process is most useful.—*Chemist and Druggist.*

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

W. J. C. (Chippenham).—*Printing-in Clouds.* The method of printing skies into landscapes is described in most of the text-books; you will find such instructions in Chap. XIX. of Mr. W. K. Burton's "Modern Photography," and another method at page 138 of the Year-Book for 1890; but the best plan, when the view admits of it, is to try and stop off the sky during part of the exposure by a flap shutter delicately manipulated. Look first on the ground glass and see to what angle the flap should be lifted to meet roughly the line of horizon, and then work mainly for this, with a momentary extension to full aperture to take in the sky. You must be quick, but after a little practice the plan succeeds perfectly; indeed, the use of a flap shutter alone often masters the difficulty.

Exhibitor.—*Leeds and London.* There will be plenty of time between the 12th and 21st November for sending on your London exhibit to the Municipal Art Gallery, Leeds. When the time comes round—middle of September for London—it would be as well to acquaint Mr. Bourlet with your intention, puttiug in a card already addressed for that purpose.

C. A.—*Copyright in Small Reproductions.* The fuller information given in your second letter sets the matter at rest. 1. The safest course generally is to assume that *all* portraits of celebrities are registered, although we admit it has become a practice with some photographers to mount most of their portraits on "copyright" cards. 2. Endeavour to get the consent of the remaining four. 3. We are now practically agreed.

C. F. B. (Lynton).—*Aristotype Paper.* The best way is to communicate again with the maker direct, for the finest results are only to be got with freshly-prepared material. The ageut meutioned in your letter is the same to whom we should have referred you with confidence.

W. D. (Dorchester).—*Chloro-Platinite of Soda.* This is produced by the cautious action of heat upon the double chloride of platinum and sodium. If you do not wish to attempt its preparation, enquire of Messrs. Johnson and Matthey, Hatton Garden, E.C.

F. C. S.—*Society of Chemical Industry.* During the recent meeting of the Society at Trinity College, Dublin, a group of 112 members was photographed on the steps of the Dining Hall by Mr. W. Lawrence, of 5, Upper Sackville Street. The plate measures 15 by 12 inches, and is in every way satisfactory, the portraits being all perfectly distinguishable.

G. J. S.—*Monday's Thunderstorm.* The total raiufall in Canonbury amounted to ·68 inch, but of this exactly one-half fell in twenty minutes, soon after four o'clock, the effect of which was to produce flooding in many places.

E. M. (Crewe).—*Tinting Plates for Isochromatic Work.* The use of an alcoholic solution for bathing the plates is hardly satisfactory, for gelatine is totally insoluble in spirit, and the colour would be imperfectly or irregularly distributed. You might try a mixture of half spirit and half water if you wish to hasten the drying of the films, but there must be a great advantage in introducing the colour uniformly by mixing it in with the emulsion.

Cambs.—*Exposure Note-Book.* A very handy little note-book ruled in columns for entry of particulars has just been issued by Messrs. Mawson and Swan, who will supply it gratuitously on application.

---

The business at Birkbeck Road, Kingsland, of Mr. E. G. Platt will in future be carried on under the title of Platt and Witte.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1718.—*August* 7, 1891.

CONTENTS.



## PHOTOGRAPHIC ADVERTISEMENT.

Time was when the town crier was an important factor in the diffusion of advertised knowledge. The nuisance of this official's drawling and inharmonious acclaim is now, happily, nearly obsolete. Advertisement by means of a bell has always distressed men of a sensitive or nervous constitution. We are not all equally robust with Dr. Johnson, who would probably have listened with equal indifference to the most exquisite of the melodies of Mozart, and the monotonous clang of the evening muffin man. Even the "church-going" bell has been considered by some irreverent people as an unnecessary annoyance. All methods of advertisement which offend the ear are, perhaps, more irritating than those which are submitted to the eye. It is, indeed, utterly vexatious to find in the middle of an interesting story—where, it may be, the hero and heroine, parted by so many columns of distance, are at length about to meet again—a full-page notice of the virtues of Jones's Juniper Gin or Blogg's Poison for Blackbeetles; but this is a momentary torture, an agony less distressing than the continuous instrumental or vocal noises produced by lay or religious advertisers, with the object of making themselves and their wares known far and wide. Pictorial advertisements are, perhaps, less objectionable than those of the letterpress; less time certainly is consumed in their consideration. It is into these that photography most largely enters. Most of the mighty theatrical and other illustrations which adorn the hoardings erected about the waste places of our metropolis are taken originally by photographic aid. Afterwards they are enlarged and retouched and painted in such fashion as, in the workman's opinion, may be most likely to attract the admiration of all beholders.

Curious tales have been told of photographic advertising. There is a story that a secret engagement was on one occasion entered into between a well-known advertiser—whom we will call Robinson—and a photographer of no high repute in his profession, by which the latter, while taking nothing—except, indeed, his portrait—from the sitter, was enabled to secure double fees from the energetic advertiser, Robinson. The sole condition in the agreement was, that in every case the sitter should hold in his hand a book, or card, or newspaper, or other convenient object, on which a legend concerning Robinson's Sauce was so conspicuously and clearly printed that none who looked on the photograph of the sitter could avoid seeing at the same time the advertisement of the sauce. An additional fee was given by Robinson in the exceptional case of the sitter allowing his portrait to be publicly exhibited in the show-case of the photographer. This piece of pushing enterprise is said not to have met with the success which it undoubtedly deserved. Pleasant it surely was for the sitter to have his carte taken for nothing, but when the time came for its presentation to his beloved, or to his aged parents, or to any one of the members of his flock, careful inquiries naturally arose about that sauce of Robinson, which must have troubled considerably the sitter's soul.

Another method of photographic advertisement, unlike that just mentioned in that it was rewarded with no small quantity of success, was originated by some master-mind of photographic invention only a few years ago. Its object was to procure recruits for the army. This desirable result was effected by means of photographs, ungrudgingly coloured with the showiest and most brilliant pigments, of officers and privates of all the leading foot and cavalry regiments of Great Britain—the Royal Artillery, the Royal Engineers, the Army Hospital Corps; in a word, her Majesty's military forces were all displayed on their respective cartes, lustrous in the glory of those bright and glittering uniforms which, it has been asserted—though without sufficient consideration—have, in addition to the pecuniary emolument bestowed by Government, no little power in swelling the ranks of enlistment, and extending the roll of the recruiting sergeant. On the backs of these photographic cartes were commonly printed the advantages to be obtained from a military life; not, indeed, conceived in such a spirit as might have animated them had the late Mr. Bright been their parent, but in such liberal terms as might have been penned by some martial Pindar on the occasion of an exceptionally vinous mess. These cartes acted as very efficient auxiliaries to the huge coloured posters which have proved so attractive on so many occasions to agricolous folk as to lead them up to London, and afterwards—well, into all the pomp and circumstance of glorious war.

Another instance of the photographic puff is only too familiar. It meets us at home and abroad, in the secluded hamlet and the roaring Strand, in the refreshment room, the railway carriage, and the City omnibus; were it not that it is as yet happily excluded from our places of worship, it would be indeed ubiquitous. This omnipresent photographic energy consists in the portraiture of well-known persons in some ingenious connection with an article which it is the life-long purpose of its astute vendor to noise into notoriety and fame. Some time back this puff attained such alarming and offensive proportions on America's congenial soil, that its growth had to be checked in one of the States by the iron clamps of legislative interference. One of those amiable gentlemen, whom we are accustomed to treat with gross ingratitude or careless indifference, who are for ever beseeching us to come to them and be cured of all our bodily and mental ills, what time we with strange, nay, lunatic perversity eye them askance, turn an adder's ear to their invitations, and insist in their despite in remaining sick—in a word, a patent medicine vendor—had introduced, without any authority, the photograph of Mrs. Cleveland, the wife of the President, into his medicinal bundle. The lady appears to have resented, very naturally, this impudent insertion, and one of the American States thereupon passed a law making it a penal offence to use any photographic or other portrait for a purpose of this nature without express permission.

How far the faces of those ladies who smile down upon us from the roofs of our metropolitan vehicles—a smile in harmony with the praise they are represented as uttering of a certain toilet requisite and detergent—how far these simpering faces are paid for is not, perhaps, generally known, nor is it, indeed, in any way material to the public weal. We are content to bask in the sunshine of their beauty, and to ask no questions. But the matter is otherwise when the advertising photograph represents, not a blushing Hebe, but some decrepit and hideous old harridan, snatched from the gaping jaws of death by the timely aid of Peters' Pulmonary Pills. Such a picture as this bears too commonly, in addition to the repulsive nature of the subject, the stamp of unskilful execution. The ghastly portrait is too often a corrupted enlargement of an originally vicious carte. In this photograph, the lady represented is supposed to have been preserved for the light of this world by the all-potent action of certain medicaments. There is, therefore, some *raison d'être* for the exhibition of her portrait; but this reason in photographic pictorial advertisement is not always to be found. For instance, there appears to be no essential connection between the pretty little girl who is manipulating a certain well-known hand-camera, and the camera itself; the work might have been effected as well—or perhaps better, for the purposes of the advertisement—by the failing power of a sexagenarian invalid. Such a picture would show how little physical force was necessary for the management of the machine; but, on the other hand, it would have been destitute of the seductive attraction of adolescent feminine loveliness.

This matter of adscititious loveliness constitutes the chief feature in many advertisements by photographs, as in the notorious example of the girl and the cigarettes. Alien, indeed, from its subject is an advertisement consisting of a photograph of two persons, male and female, standing by the shore of the ocean, with the following printed announcement on the reverse side of the picture: "What are the wild waves saying, sister? Listen, brother, and you will hear. The wild waves are saying that John Smith is making the very best photographs that can be made anywhere in the wide world at the following prices." A list of prices of carte and cabinet follows. "Do not be deceived by egg-shell finish. Listen to what the wild waves are saying. I positively assert, &c." The announcement becomes at the conclusion somewhat profane. "Remember, we are open Sunday—always have been, and always will be—as it is a great accommodation to the public. The churches are also open on Sunday for the accommodation of those that cannot attend during the week. Furthermore, I have made pictures of ministers on Sunday, and delivered the pictures to them on their way from church."

---

Photographs on Silk.—Those chemists who are practical photographers can well utilise silk for presenting their customers with souvenirs—satchets, almanacs, &c.—at Christmas time. Sensitised silk can now be obtained commercially, but there is not much difficulty in preparing it. China silk we have found to be the best, and there is a great variety of ground tints to choose from. The silk must be well washed to free it from dressing, and then immersed in the following solution:—

| | |
|---|---|
| Common salt ... ... ... ... | 4 grammes |
| Arrowroot ... ... ... ... | 4 ,, |
| Acetic acid ... ... ... ... | 15 c.c. |
| Distilled water... ... ... ... | 100 ,, |

The arrowroot is dissolved in the water by the aid of a gentle heat, and then the other ingredients added; and finally—

| | |
|---|---|
| Tannin ... ... ... ... ... | 4 grammes |

dissolved in—

| | |
|---|---|
| Distilled water... ... ... ... | 100 c.c. |

are also added, and the mixture filtered. The silk is allowed to lie in this salting bath for three minutes, hung up to dry, and afterwards sensitised on a silver bath as follows:—

| | |
|---|---|
| Nitrate of silver ... ... ... | 3 grammes |
| Distilled water... ... ... ... | 25 c.c. |
| Nitric acid ... ... ... ... | ½ drop |

The silk is floated on this for one minute, then hung up till surface dry, and finally pinned out on a board till thoroughly dry. It is printed in the usual way, and washed and toned as usual, though we have found the mixed acetate and sulphocyanide bath give the best tones.—*Scientific American.*

## BROMIDE ENLARGING.*

BY G. D. MILBURN.

Enlarging on bromide paper ought to be of interest to all, because a good enlarging process is a great desideratum in every first-class photographic studio.

It is a well known fact that, in the average of cases, small size negatives give better satisfaction to patrons of photographic studios than larger ones. There are many reasons for this, in which the lenses used play no small part, causing more or less distortion, to a much greater degree in large work than in small—the operator is more accustomed to small work—it takes less time of exposure, and costs less if a small plate is spoiled; therefore, he is more willing to try it over again if the first sitting is not up to his usual standard. Many other reasons could be enumerated in support of my assertion that prints from large negatives, as a general rule, do not give as much satisfaction as prints from small negatives.

Having produced a good small negative which pleases the sitter, it is a very easy matter, by using a little honourable business tact, to sell your customer a good, artistically enlarged picture from the same negative. Or will you argue, "A photographer has not the same right to call attention to his goods that other respectable business men have"? or perhaps you will say, "It is not necessary to call especial attention to our large work, for our customers are aware of our facilities for producing that class of work before entering our studios." The latter is, no doubt, true in many cases, but experience has taught every first-class business man in the land that his goods must be prominently brought to the attention of customers and the public time and again if success shall be his. In other words, I contend that, while you practise photography as an art, it behoves you to also practise it as a practical business, and with that end in view I wish to call your attention to the bromide process as a very valuable auxiliary.

A very successful method of introducing large work, as practised by many, is to have an enlarged print ready for the purpose of showing to the customer when the small contact prints are called for, then, by slipping the said enlargement into a convenient, suitable *passepartout* or frame, explaining in the meanwhile the different styles in which the enlarged picture can be finished—such as crayon, oil, or pastel—a sale will invariably follow, and if, occasionally, no sale, the loss in cost of material for making up the print is very trifling indeed.

While on the subject of frames, I wish to show you what enormous difference it makes to a large bromide print to be appropriately framed, also the difference one hour's crayon work makes on a good bromide print.

When first the process was introduced in this country, there was much speculation rife as to the permanency of bromide prints; but this has ceased now, for it has been conclusively proved that when prints are properly made from good permanent bromide paper they are as lasting as any other photographic prints whatsoever.

When the bromide process was first introduced in this country, many photographers began using it, some only soon to give it up, claiming that it was much more difficult than they had anticipated. This was due to the great uncertainty in results, as well as the different methods which can be adopted to secure good results.

* Abstract of a communication to the Buffalo Convention of the P. A. of A.

From a strong negative, it is possible to produce either strong or soft prints, and the same from a soft negative.

Some photographers are successfully using hydrochinone and also eikonogen, as developing agents. After extensive experiments, we have concluded that the iron oxalate is the very best developer for bromide prints. However, I own that there is more latitude in the actual development with the two former developers, inasmuch as the operation can be commenced with weak developer, increasing in strength as it is found necessary. On the other hand, with the oxalate developer, we get a purity of white and blacks unattainable with the others.

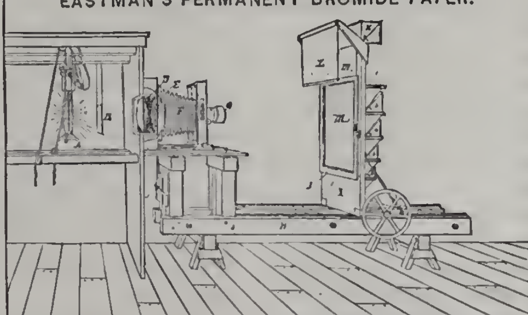
To proceed with the demonstration. If upon examination of the negative to be enlarged, it is found difficult to determine the correct amount of exposure to be employed, do not venture to expose a large sheet of bromide paper, but, as a guide, place in position on the easel a small piece of bromide paper; that is, after the image has been projected to the proper size, and focussed sharply; then expose and develop.

If daylight is used for exposure, care must be taken to permit as little time as possible to elapse between the exposure of guide and print, as the light is apt to vary, making your guide useless. On dense parts of the negative, extra time can be given on the same plan as vignetting, and very deep shadows can easily be held back by means of a shaped card on the end of a strip of glass.

The amount of bromide solution used in developer has great influence on the quality of bromide prints. For weak negatives, the amount of bromide solution can be doubled or trebled to advantage, and, for strong negatives, it can be reduced to half or a quarter the normal amount. However, with fresh, normal developer, some bromide solution ought always to be used, or a measly, mottled deposit may cover the print.

To insure permanence, care must be taken to remove all the iron solution after development, by washing thoroughly with acid solution, and all white light excluded until the print is thoroughly fixed in the hypo, and the final washing must be very complete.

APPARATUS FOR ENLARGING WITH EASTMAN'S PERMANENT BROMIDE PAPER.



The apparatus necessary for bromide enlarging, as you see, is very simple, a camera, lens, and easel, being the most essential parts.

Daylight is very good for enlarging, giving a smooth, even illumination. However, when a large quantity of work is to be provided for, the arc electric light is most convenient, as it is powerful and practically uniform.

---

Photographic Club.—Subject for Aug. 12th, Report of Delegates to the Convention, illustrated by the lantern; Aug. 19th, "The Primuline Process." Saturday outing (Aug. 8th), Cheam; train from London Bridge 2.18.

## PHOTOGRAPHING LANDSCAPES BY MOONLIGHT.

The many fabulous stories told about moonlight photographs, the incredulously short time of exposure occasionally alleged as sufficient to make them, a few very remarkable facts having come lately to our knowledge, and the desire of several of our readers to learn of the experience of others regarding moonlight photography, have induced us to explain, to the best of our ability, what the light of our satellite is really able to do photographically, and what it is unable to do.

Owing to the extremely feeble actinic force of moonlight it is impossible to obtain instantaneous views by its aid, and a fully exposed negative can be obtained only by large apertures of lenses of great luminous power, and by long exposure upon highly sensitive plates.

To make pictures by the aid of moonlight is nothing new, the first experiments made dating back to the earliest times of Daguerreotypy, and the first moonlit picture exhibited publicly was a white marble bust by Breeze, at the London Exhibition of 1851. On account of technical difficulties resulting from long exposures on wet collodion plates, the attempts made then were but rarely successful, and only after the introduction of collodion dry plates were more satisfactory moonlight pictures really possible.

The first moonlight photograph we ever attempted was that of a white painted frame house, with an exposure of three hours upon a Sutton collodion honey plate, with an 8-inch focus single achromatic lens, stop *f*/16. Result: a very faint image after a long and tedious development with pyro. Later, much better success was had with a view of a brick house, a Fothergill plate, the same objective and stop as before, and an exposure of from 8 p.m., perhaps, to 5.30 a.m., in the light of the full moon of a bright November night.

Burton states positively that to photograph a landscape illuminated by moonlight requires from 300,000 to 3,000,000 times longer than the same landscape illuminated by sunlight. E. Von Gotthardt indorses what Burton says, and speaks of these facts more definitely when describing some experiments he made. To convince himself of the impossibility of certain claims, he exposed first highly sensitive orthochromatic plates, with a No. 1 Euryscope full aperture for three and five minutes, upon a moonlit landscape, without any result, and forty-five minutes produced a very much under-exposed negative; double, and more than double the time presumably being required to make a perfect negative. The experiments were repeated in full sunlight, the lens stopped down to its smallest aperture, and, all other conditions being the same, a beautiful and perfect negative resulted from an exposure as quick as could be made by hand.

Von Gotthardt now reasons thus: Supposing the sunlight exposure had been 0·5 of a second, and the stop used had allowed but $\frac{1}{24}$ part of the light to act which acts with the full aperture, and further supposing that 100 minutes=6,000 seconds in moonlight, would give with the full aperture the same results as obtained in sunlight, that is with the smallest stop in 144,000 seconds, we must then deduce that sunlight is $144{,}000 \times 2 = 288{,}000$, or in round numbers 300,000 times more intense than moonlight.

Eder speaks of an experiment by which he found the intensity of moonlight to be 6,000 times weaker than that of a magnesium wire burnt in the focus of a concave mirror, and states further that he had made a moonlight landscape by an exposure of three hours upon a plate 20 deg. Warnerke, with a Steinheil aplanate, stop *f*/10.

Henderson, under conditions similar to those of Eder, exposed for seven hours, and Jahr had perfect negatives in eight and nine hours.

Dunmore obtained a very rich and harmonious moonlight landscape in five hours, and it is said that Colard and Holmer had the same results in from one to two hours, while Causson and Co. exposed for thirty minutes with the full aperture of a portrait lens. The great difference of the times of exposure stated is owing mainly to the different forms of the objectives employed and their focal length, but is not at all contradictory to the principle laid down by Von Gotthardt. Causson and Co. used a portrait lens, and Jahr a Dallmeyer rectilinear, both with perfect success, it is said.

Our latest attempt to make a moonlight picture was by the full moon of last August, the object being a white building surrounded by trees at a distance of about two hundred yards. The plate, a Carbutt Eclipse, the lens a Gundlach rapid rectigraph No. 3, stop *f*/11. A heavy bank of clouds coming up the horizon interrupted the exposure, intended to be seven hours, and but ninety minutes were given. A tedious and long-continued development with hydrochinon produced the outline of the landscape, and but a feeble impression of the white building.

For scientific purposes, and as a technical object lesson to the photographer, the attempts at making pictures by moonlight are very instructive perhaps, and are otherwise interesting; but artistically they do not amount to much. Light and shade are not distinctly defined, as the motion of the moon obliterates all artistic effect in the prolonged exposure, and the finished picture reminds one of the works of Chinese artists, totally devoid of details, as well as of light and shade.

Moonlight photographs with distinctly pronounced shadows are impossible, and those claiming to be so are invariably made by daylight produced by a variety of clever printing and other dodges, and may be very beautiful so far as the moonlight effect is concerned.—*The Photographic Times.*

---

Mr. Tylar, of Birmingham, seems to have an inexhaustible faculty for devising clever contrivances for the comfort of photographers. His most recent one is a very cheap single dark slide, stamped out of one piece of metal, and neatly reversed to hold the plate or film. The shutter, also of metal, draws right out, and the movement can be executed without any chance of stray light finding its way where it is not wanted.

A New Platinum and Gold Toning Bath.—A well known amateur, the Rev. H. B. Hare, has suggested the use of the ordinary gold and borax toning bath, and then a platinum bath for ordinary albumen prints. The prints are just wetted, then immersed in the ordinary borax bath A:—

| | | |
|---|---|---|
| A.—Chloride of gold | ... ... ... | 2 grains |
| Borax | ... ... ... ... | 90 ,, |
| Water | ... ... ... ... | 12 ounces |

The prints are allowed to remain in this till they assume a warm brown colour, are then removed and placed for a minute in clean water, and then placed in the platinum bath B:—

| | | |
|---|---|---|
| B.—Chloroplatinite of potassium | ... | 24 grains |
| Citric acid | ... ... ... ... | 60 ,, |
| Salt | ... ... ... ... ... | 96 ,, |
| Water | ... ... ... ... | 12 ounces |

When they quickly assume a fine purple black.

## NOTES ON PERSPECTIVE DRAWING AND VISION.

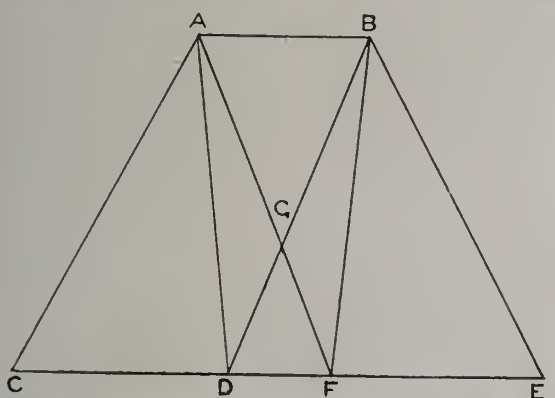
### Replies to Various Criticisms.

BY DR. P. H. EMERSON AND T. F. GOODALL.

We shall reply to our critics in the order of appearance of their papers.

Mr. Slight, an "old perspective draughtsman," is the first to take the field. We omit any comment upon the bad taste shown in his first paragraph, and proceed directly to his intellectual parts. We regret Mr. Slight cannot get the impressions we have obtained, and we can only answer that necessarily such impressions are easiest seen by trained observers. or by persons with delicate nervous organisations such as all good artists possess. We assure Mr. Slight that several artists have, since we pointed these facts out, seen things in the same way as ourselves.

Mr. Slight takes an example which we give to show the effect of *binocular* vision, and immediately proceeds to show that the effect seen by *monocular* vision is different; we refer to the tapering slip of paper experiment. Such criticism is ridiculous, and shows how incompetent Mr. Slight is to discuss such matters. We give a diagram which will roughly explain. Let A B C D and A B E F represent the monocular perspective impressions of the slip of paper, both *vanishing towards* A B. Now, what you get with binocular vision is the figure A B D F vanishing




towards D F—an *inversion* of perspective. What Mr. Slight has seen is the figure C B G; therefore our figure A B D F is not caused by *overlapping*. If Mr. Slight fixes the paper at the normal *distance of vision* (say 5-6 inches) he will get the true impression easier.

Mr. Slight next objects to measuring with two eyes. Undoubtedly, this experiment is difficult to the inexperienced, but it is merely another way of stating Proof 2, page 6—the square sheet of paper experiment. There are persons, however, who can measure with two eyes, and the figure given in answer to the last criticism fully explains the truth of the observation. The experiment is very easily verified by measuring large objects. And these are all Mr. Slight's objections. Mr. Slight then goes on to say that if people shut *one* eye and look at a photograph from one particular point of view, they will see it rightly. In the case of a cyclops we do not dispute this, but we see nature *with two eyes*, and that is the point. Mr. Slight, too, is naturally biassed by his previous training. All photographs and monocular perspective drawings are, we maintain, altogether false to the visual impression.

The next is Mr. Boord, who is, unfortunately, *hors concours*, since he is short-sighted and wears glasses. Mr. Boord has pleasantly advised us to go to our oculist. We have no occasion; our sight is normal.

Mr. Boord avoids the main proposition, ostensibly from fear of the British policeman. We have found others unable to study some of the propositions from an accumulation of adipose tissue, but the policeman is new to us. Mr. Boord asks whether physiology bears this out. We ask Mr. Boord whether physiology does *not* bear this out. Seriously, we are awaiting some researches on this point. Mr. Boord seems to think that he has overthrown Proposition B because evolutions must have eliminated all such defects. Why, then, have we the remains of a caudal appendage? Perhaps Mr. Boord will tell us?

Mr. Boord then gets muddled over foreground and distance. Our researches are for objects seen in one position, which we shall call the real position; one position must be selected as the real position. We therefore take the generally accepted—*i.e.*, a plane at right-angles with the ground plane. When you look at the plane at a distance, you see foreground as well as distance. When you look at the immediate foreground you alter the plane, and it is just the same as if the body were suspended at an inclination, and all the same phenomena will follow, but with different objects. Mr. Boord refers to Dr. Emerson's naturalistic law of focussing. This is the best compromise, both artistically and scientifically, for photographers, but the results are in no way true to the visual impression, but the truest that can be got by the camera.

Next we do hear of "eye troubles." We do not hear of sailors going about in spectacles, and we do hear of most kinder-garten bred Germans doing this. Results of this kind are formed by ages of experience, and outlive their causes. We again refer Mr. Boord to the remains of a tail which he possesses. Mr. Boord has little idea of the difference of delicacy of vision in different persons. It is greater than the difference between a good musical ear and a bad one, though not so easily demonstrated. We have several photographs of the Parthenon, and they do *not* appear parallel to us; neither are they, nor will they appear so to any person of normal vision. Mr. Boord then says if he turns the photo upside down the columns will appear parallel; obviously, they cannot appear parallel *both ways*, for, as he says, by measurement they are not parallel. It appears to us that Mr. Boord has wilfully deceived himself. As to the door, we find most people get the impression we do. Mr. Sutcliffe has published his observations, and we cite Mr. Sutcliffe, as Mr. Boord cites him against us. Mr. Sutcliffe's experience will, then, pass as sufficient answer to Mr. Boord. We shall be glad to consider any geometrical diagram offered by Mr. Boord, but suggestions of such are not proofs. Mr. Boord then goes on to give the difference of visual impressions and chemical impressions due to atmospheric effects. This is a point we are working at. Mr. Boord is quite right; the photograph does not give the "loom" of objects, and this is an *additional* deathblow to the pretensions of photography as an art. Photography gives quite a different result to that seen by the eye as regards atmospheric effect, *in addition* to the difference of perspective when atmosphere is not considered. Mr. Boord seems, however, to make it a virtue of photography that it *does not* give the loom, but gives exactly the objects before it, and that after trying to refute us because we show that photography does give exactly (mathematically) and not visually what is before it. Exactitude is the virtue of photography, which makes it unsurpassed for all purposes of scientific drawing, and which renders it obscure as an art medium.

Next comes C. J. Mr. Chapman Jones refers to us in his leader in *Photography*. We wonder at his temerity in saying drawing and photography are the same thing after the explanation of that accomplished draughtsman, Mr. J. Pennell, that they are not the same. We would recommend Mr. Jones to study an elementary treatise on perspective, and to take some elementary lessons in drawing from the model, and then compare the result of both methods, and perhaps after that he will see reason to alter his last statement. Mr. Jones says without hesitation that photography does not dwarf the distance; he, of course, compares it here with a monocular perspective drawing, which we contend is just as false as photography. Mr. Jones then suggests that the photographer should get further back. This has been the custom with many artists, and the practice we hold to be a fundamental error, and consequent on the teachings of monocular perspective. This is merely a convention, and does not give you a visual impression; it is merely monocular perspective drawing with the errors made to look less glaring; it is a monocular impression, and not a binocular. Such a treatment would preclude the artist from drawing interiors altogether. In short, it still remains a monocular impression, and false to the visual impression. We are combating the whole convention of monocular perspective, which the best artists in France have already discarded in practice. The lengthening of the image by tipping swing-back is merely distorting the monocular perspective drawing, and in no way affects the case; the results are not so true as the throwing distance out of focus. Where there is no difference between the photograph and the draughtsman, so much the worse for the draughtsman. Possibly some misled amateur photographers will rather gouge out an eye from everyone in the world than give up their cyclopean box. How a drawing is to be done we do not enter into, but leave that to each *individual* draughtsman, who, if he possess any ability, will do it in his own method, as did Velasquez, Rembrandt, and others.

Next we come to Mr. Sutcliffe, who seems to be our only critic with sufficient art knowledge and capacity of observation qualifying him to understand our pamphlet. Mr. Sutcliffe only finds difficulty with Proof 1, Prop. B. We would suggest to Mr. Sutcliffe that he must have tilted his head and eyes back in looking at the tower, and consequently changed his plane of vision. We think it possible it was a tall lighthouse, and he was too close to take in all the tower without changing his head. As far as to the bulging and tapering to the base, it coincides with our views.

Mr. Sutcliffe asks whether, because we see a doorway wider at top, we will not also see the doorway corrected in a photograph. We answer possibly; but the whole photograph will not be correct, on account of the extreme disproportion introduced by monocular perspective when objects are reduced and seen on one plane. If people look at a photograph with one eye, and be satisfied, we would suggest at the next Photographic Society of Great Britain exhibition that everybody have one eye bandaged as he goes in, and every picture should have a measure before it of focal length of lens employed. Photographs are all wrong artistically; they are altogether false to our every-day visual impression. The photograph of a man with boots five times as big as himself is correct in Mr. Sutcliffe's sense—*i.e.*, mathematically correct—but that is only an extreme expression of the fallacy which runs through the whole thing. Photography has nothing to do with art. We thank Mr. Sutcliffe for making such careful experiments before committing himself to print, as is the habit of the "amateur."

Lastly, we come to Mr. Debenham. As regards his second paragraph, it might have been left to *finish* his paper with, for then we should have had a clear idea of Mr. Debenham's intellectual powers, and of his vague notions of the meaning of the words "exact," "loose," "indefinite," &c. To disprove our first proposition, Mr. Debenham tells us that *perhaps* a rush of blood to the head, or *perhaps* a lower point of sight, or *perhaps* confusion may do it; and this is "exact" proof, and this is not "loose" nor "indefinite"; it is puerile, at any rate. Has Mr. Debenham any reasons to give why "confusion" or "rush of blood" to the head, &c., does not make the distance look bigger instead of smaller? Mr. Debenham then "plots" Proof 3 mathematically, which was not intended by us, but which we do not object to, for Mr. Debenham's arithmetic now states exactly in figures what we saw exactly with our eyes, but with Mr. Debenham's deductions we entirely disagree, for, although the difference is inappreciable arithmetically with such a small object as the slip of paper, it is of fundamental importance when dealing with buildings; or why did the architects of the Parthenon take such trouble over these matters if the differences were imperceptible? So much for Mr. Debenham's disproof. Mr. Debenham cannot see the door look wider at the top than bottom when looked at as he suggests. Our experiments were made under similar conditions, and we do see the door wider at the top; so does Mr. Sutcliffe and every artist. Mr. Debenham should remember that the Parthenon was to be viewed from the *ground*. This is another of Mr. Debenham's "exact" disproofs.

Mr. Debenham next objects to the material "paper" used for Proof 3, and says "it is asserted if both are held at a distance," &c. Did it not occur to Mr. Debenham to use stiff paper or cardboard? We assumed that the experimentalist had sufficient intelligence to place the slip of paper in the required position for experiments, nor have we been disappointed. We would point out that we did not assert that "both are to be used," but only *one at a time*. To answer Mr. Debenham's objection that people get what they "expected," we answer that the experiments were made by people who had no idea what was "expected" of them. But such criticism is absurd. Anyone can try these experiments with whatever precautions he likes. So far, no one has *disproved them*. Many "loose," "inexact," and captious remarks have been made upon them.

Next we come to the coin experiments. Mr. Debenham, as usual, anticipates his own "disproofs" by his choice words "loose" and "inexact." As to what distance the eye is to be placed, or at what level above the table it is, does not much matter—a pedant might think otherwise, for is not science measurement according to the petty and "unlettered scientist?" Mr. Debenham has invented a gallows-like machine which he has erected for the execution of our coin-proof. Now Mr. Debenham is going to be "exact," and "scientific," and all that is stolid. Mr. Debenham blames us for not erecting a monument to our own damnation. We made the experiment, but not in Mr. Debenham's way. We inserted the penny and halfpenny in a notched stick, so that we could look at it from below and above the line of sight, and we found that our experiment, so far from upsetting our proof, tended to confirm it. When the penny was above the line of vision, it looked larger in proportion to the halfpenny than when it was below. Mr. Debenham said it should, and for once he is right, and *it did*, and does, as anyone can prove to his own satisfaction. Mr. Debenham's great gallows-machine is quite vitiated by the very simple fact that the structure compels one to look at the coins through an eye-hole, the effect of which is to cut off that portion of the field of vision which causes the phenomenon observed. And this is "exact" and not "loose," nor "indefinite," and this in *science* according to the gospel of the photographer.

Mr. Debenham will find the answer to the rest of his paper in the replies to other critics.

Finally, we beg earnestly—since life is short—that untrained and rash persons will not make it necessary for us to waste time in educating them.

P.S.—We are glad to find such an authority on the eye as Dr. Griffith accepting our experiments and observations, but Dr. Griffith goes wrong in his deductions; for, as he says, he is not an artist, or he would have known that the artist gives a compromise, and that the camera does not give correctly the proportion between near and distant objects, nor a compromise in any form.

## CITY AND GUILDS OF LONDON INSTITUTE.

The following concerning the subject of photography is taken from the Programme of Technological Examinations. Among alterations and additions to which attention is called in a circular accompanying the Programme is the following:—"Practical tests have been added to both grades of the examination in photography, the syllabus of which has been rewritten."

I. *Syllabus.*—Candidates will be required to pass both in the written and in the practical parts of the examination. The practical tests will be held on Saturday, May 7th, from 3 to 7.30 p.m.

### Ordinary Grade.

(i) *Written Examination.*—The Written Examination will include questions founded on such subjects as the following:—(1) The studio and lighting of the sitter; (2) the lighting of the dark room; (3) the use of stops, shades, and "instantaneous shutters," as applied to lenses, and the use of the swing-back in the camera; (4) a general knowledge of the practice and theory of the wet plate process; (5) the practice and theory of the gelatine dry plate process—the composition of and defects in gelatine dry plates; (6) various methods of fixing and intensifying negatives, with a general knowledge of the chemicals employed; (7) silver printing, including vignetting and printing in clouds, toning, and fixing; (8) principles of retouching, spotting, and mounting prints.

(ii) *Practical Test.*—Candidates may be required to show proficiency in conducting any of the following practical operations:—(1) To take in a studio $\frac{1}{4}$-plate gelatine negative of some object to be indicated; (2) to print, tone, fix, and mount a print; (3) to retouch and spot a negative; (4) to test a sample of glass or fabric to be used in lighting the dark room; (5) to make a lantern slide by contact.

### Honours Grade.

(i) *Written Examination.*—In the Honours Examination, more difficult questions will be set in some of the subjects for the ordinary grade, and, in addition, a knowledge will be required of—(1) the theory of the photographic image, of development, and intensification; (2) the theory of light as applied to photography, including a general knowledge of spectrum photography, and the construction of lenses; (3) the theory and practical use of sensitometers for testing speed and gradation of plates; (4) the principles of photographic optics; (5) the general principles of the Daguerreotype, and other negative processes which have been employed at different times; (6) platinotype and carbon printing, preparation of a photo-lithographic transfer, collotype printing; Woodburytype and enamels; (7) enlarging and making lantern slides in the camera; (8) applications of photography to scientific purposes.

(ii) *Practical Test.*—Candidates may be required to show proficiency in conducting any of the practical operations for the ordinary grade, and, in addition, the following:—(1) to take a portrait with some special lighting indicated; (2) to find the focus of a lens either corrected or uncorrected; (3) to test the sensitiveness and gradation of a plate; (4) to copy an engraving suitable for the preparation of a lithographic transfer; (5) to make a photo-lithographic transfer from a given negative; (6) to make an enlargement from a $\frac{1}{4}$-plate; (7) to make in the camera a lantern slide from a negative.

II. *Full Technological Certificate.*—A provisional certificate will be granted on the results of the above examination. For the full technological certificate in the ordinary grade, the candidate who is not otherwise qualified (see rule 37) will also be required to have passed the Science and Art Department's Examination in the elementary stage at least, and for the full certificate in the honours grade, in the advanced stage at least, in *two* of the following science subjects:—1, Practical, plane, and solid geometry; 8, light and heat; 10, inorganic chemistry; 11, organic chemistry.

III. *Works of Reference.—For the Ordinary Grade*, "Chemistry of Photography," Meldola; "Instruction in Photography," Abney; "Manual of Photography," Hepworth; "Practice of Photography," Chapman Jones; "Silver Printing," Robinson and Abney (Piper & Carter). *For Honours*, "Researches on Light," Hunt; "Treatise on Photography" (Longman's Text-books of Science); Monckhoven's "Photographic Optics"; "The Chemical Effect of the Spectrum," Dr. Eder; "Light," by Lewis Wright; Roscoe and Schorlemmer's "Inorganic Chemistry."

Absorption Spectrum and Colour of Liquid Oxygen—By K. Olszewski *(Ann. Phys. Chem.* [2]. 42, 663—665).—In his former examination of the absorption spectrum of liquid oxygen (Abstr., 1887, 625), the author found bands corresponding with the wave-lengths 628, 577, 535, and 480. Liveing and Dewar (Abstr., 1891, 1), on examining the absorption spectrum of gaseous oxygen under high pressure, found the same four absorption bands in the visible part of the spectrum, and also two bands in the extreme red corresponding with the Fraunhofer lines A and B. The author has lately had occasion to prepare liquid oxygen in some quantity, and has repeated his examination of the absorption spectrum, more particularly in the extreme red. The column of liquid oxygen obtained had a thickness of 30 mm., and was 50 mm. in height. It was contained in a thin glass vessel surrounded by three glass beakers, in order to protect it, as far as possible, from outside heat. In this condition it was found possible to keep a sufficient quantity for the purpose in view, under atmospheric pressure, and at its boiling point—181·4°—for over half-an-hour. The observations gave the four absorption bands before obtained, and also a fifth corresponding with the Fraunhofer line A. This band is of less intensity than those of wave-lengths 628, 577, and 480, but stronger than the band 535. An absorption band corresponding with the Fraunhofer line B was not observed. Liquid oxygen, as first obtained in small quantity in 1883, was described as being colourless. Since then the author has repeatedly had under examination liquid oxygen in larger quantities, and he has invariably noticed that a layer of greater thickness than 15 mm. has a distinctly blue colour by transmitted light. In the above experiments, in which liquid oxygen was employed in larger quantity than had hitherto been the case, the pale blue colour of the liquid was particularly noticeable. As special precautions were taken in purifying the gas, and the absence of ozone was ascertained by special tests, there seems no reason to doubt that the colour observed is characteristic of oxygen in the liquid state. In the author's opinion, the blue colour of the sky is, therefore, probably due to the oxygen in the atmosphere, since this element, at any rate in the liquid condition, is blue in colour.

# Notes.

The Amateur Photographic Association, under the presidency of the Prince of Wales, is doing a useful work in forming a British Museum of portraits of notable personages. The idea of such a gallery of pictures has been talked about ever since the charge of want of permanence has been removed from the long catalogue of sins with which photography has been credited. On Saturday last a number of such portraits were submitted to the "private view" ordeal at 58, Pall Mall, and on the same occasion a dinner was given by the Association with the Duke of Teck as chairman. Under such auspices the work of the Association is sure to get along apace. We are glad to note that ladies who have distinguished themselves are to find a place in this gallery as well as members of the inferior sex.

There is just now plenty of opportunity for those who are fond of experimental work, and who have also a mind to contribute to the Meteorological Society's collection of pictures, to take photographs of lightning. On our Southern and Eastern coasts thunderstorms have been, during the past week, of daily and nightly occurrence, and the lightning has been of the most vivid description. Watching this lightning the other night, we could not help reflecting that many problems concerning these wonderful outbursts of atmospheric electricity remain to be solved. Why, for instance, do some of these jagged lines of fire remain in sight for a longer time than others which appear at the same instant? Why do others persist in the same position, while, during an incredibly short space of time, they are repeated again and again? Why sometimes does a flash, instead of striking direct to the earth, come near its surface and then return to another part of the sky, making an immense loop? Surely we may hope that some of these puzzles may be unravelled by means of photography.

The latest phase of trade protection is represented in Paris by the combination of artists' models with a view to air a grievance for which there seems to be justification. It would seem that there are middlemen in this business, as in most others; that these men are Italian by birth, and naturally favour their own countrymen and women, to the exclusion of French people. So the French models are up in arms, and assert that they are as well formed, and as well-favoured in other respects by nature, as their Italian rivals. It is intended that artists shall be supplied with a list of the unionists, from whose ranks they will be able to choose their Dianas, Venuses, &c., without troubling the Italians.

Such a demonstration on the part of artists' models will not at present affect photographers; but who knows how soon photography may employ such aids to picture-making? We can recall some exquisite little photographs in which models were employed, which pictures a few years ago deservedly won a prize at one of our exhibitions. They were the work of one who was a painter by profession, and admirably he had adapted his artistic knowledge to their production. The subjects were Pompeian. Carefully arranged accessories in the shape of a fountain-basin, tesselated pavement, &c., all looking as if they had been borrowed for the occasion from the Pompeian house at the Crystal Palace, combined with suitably draped figures of a boy and girl, were the materials employed in the composition. We fancy that many more such pictures would be produced if only models were brought into contact with photographers as they are with knights of the brush.

The artists and sculptors chosen to decide the design for the new coinage are still sitting. We have not heard whether the photographer has yet been called in to assist them, but we fancy that the photographs of her Majesty can hardly be ignored if anything like a portrait is desired. The absurd caricatures which figure in the present jubilee coinage were probably not the fault of the late Sir J. E. Boehm, as he had to adopt the Queen's idea of what she fancied she was like. The approbation of Royalty must always fetter the artist. *Apropos*, one can hardly fancy the Queen approving the statue of herself which now stands conspicuous in the Royal Exchange, yet we suppose she must have expressed her satisfaction at the time. This statue deserves to be photographed, if only to show how an infinitesimal quantity of art satisfies the good citizens of London. If these photographs were publicly exhibited in the print shops of the metropolis, this frightful effigy would not remain another week in its present situation to be laughed at by foreigners.

Human nature in front of the camera is a curious study. Directly persons are told they are about to be photographed they draw themselves up in a stiff drill-sergeant attitude, put on their sternest expression, and prepare to be "took." We had an opportunity of seeing a glaring example of this kind of thing on Bank Holiday at Dunmow, on the occasion of the presentation of the time-honoured flitch. There were three couples as claimants, and previous to the trial it was intimated that the scene on the platform would be photographed. Instantly the smiles fled from the faces of the three husbands, and the simpers from the countenances of the three wives. Had they been quarrelling and had resolved never to speak to each other again, the expressions could not have been more stony. It was a good thing the jury had not to decide as to the fitness of the claims by the photographs of the claimants.

*Apropos* of Bank Holiday, it was impossible not to discover that itinerant photography is no longer what it was. The holiday folk have lost their fancy for posing in the open air in front of the camera; and where a dozen strolling photographers used to make a good living, there is scarcely sufficient trade for one man. The best business is done where picnics most abound, say in the neighbourhood of Epping Forest; but there, we believe, are restrictions which prevent over-competition.

The shareholders in the Automatic Photographic Co. are not at all satisfied with the state of affairs. Lord Kilmorey and another prominent director have retired from the Board; the machines, it is said, have been worked at a loss, and the assets of the Company—so far as can be gathered—are only £1,454 in cash and the value of the machines (which cost £9,000), leaving a deficiency of upwards of £26,000 to be accounted for. These and other statements are contained in a circular which has been sent out by a firm of solicitors whose services have been engaged by a number of dissatisfied shareholders.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Medical Photography—Projecting Microscope—Photographing Clouds—Reversed Titles for Negatives—Rapid Hydroquinone Developer.

*Medical Photography.*—An ingenious arrangement for taking photographs of internal parts of the human or animal body has been invented by Rud. Oelbermann, of Düsseldorf. It consists essentially of a small cylindrical camera, mounted in a small cylindrical case, which latter is provided at its front side with two hemispherical pivoted pieces or shutters serving to shut and to open the case. The case, with the camera, is inserted in that end of an india-rubber tube which is to be introduced into the body. The camera consists of two sliding parts, and is provided at its bottom with a short pipe, over which another tubing may be easily slipped. The latter leads to the outside, and is provided at its other end with a pneumatic ball. To the front sliding part of the camera containing the lens two small, hemispherical, incandescent lamps are fastened, the conducting wires of which lead between the two tubes to the outside, and are connected with two contact points. One of the two conducting wires is joined to the two poles of a battery. For use, the camera is provided with a sensitive plate, and the apparatus is introduced into the body with the case containing the camera, and is shut by the two movable shutters. As soon as the latter is opposite the part to be photographed the pneumatic ball is pressed, when the camera will be pushed forward, so that the short pipe at its back will partly leave the second tube in which it is mounted. By this movement the two hemispherical shutters of the camera case are opened, and, at the same time, the two incandescent lamps will begin to glow, since by the pressure on the pneumatic ball the circuit is established. After the exposure has been made and the pneumatic ball released, the camera will return to its case, and the whole arrangement may then be removed out of the body. It is said that this apparatus has already answered very well in a number of cases.

*A Gigantic Projecting Microscope.*—The well-known optical establishment of M. Poeller, of Munich, is about to construct a gigantic projecting microscope for the World's Exhibition at Chicago. Electricity plays an important part in the working of this magnificent instrument. It furnishes and regulates the source of light, which, mounted in the focus of a parabolic aluminium reflector, has an intensity of 11,000 candle-power. It also provides the centreing of the quadruple condenser, and of the illuminating lenses, by means of an ingenious automatic mechanism. The most important and novel feature, indispensable on account of the enormous heat produced by the intense source of light, is the cooling machine, which provides the several microscopic and polariscopic systems of the apparatus with a fine spray of fluid carbonic acid, which, immediately after its release from the copper kettle, in which it is held under a pressure of twenty-three atmospheres, is converted into the gaseous state, developing thereby such an intense coldness that the minute quantity of 0·0007 gramme of carbonic acid per second is sufficient to give the desired result. The magnifying power of the instrument with ordinary objectives is said to be about 11,000 diameters, but, with the vaseline oil immersions, it may be increased to 16,000 diameters.

*Photographing Clouds.*—At the last meeting of the Freie Photographische Vereinigung, of Berlin, Dr. Neuhauss made some interesting observations with regard to the photographing of clouds. He stated that clouds, more especially the cirrus, could be successfully photographed only by the use of the coloured liquid screen, suggested some time ago by Dr. Zettnow, which completely absorbs the blue rays emitted by the sky, and lets through only the yellowish-green rays which are contained in the white of the clouds. Consequently, the white and delicate clouds in the finished photograph will contrast excellently with the dark sky. If a bluish tone is imparted to the print in the toning bath, it will form the truest reproduction of the reality. The coloured liquid screen mentioned by Dr. Neuhauss is prepared by dissolving 160 grammes of dry, pure nitrate of copper, and 14 grammes of pure chromic acid, in water up to 250 c.c. The solution is poured in a glass tank, in which it should form a film of one centimetre diameter. More easily to prepare, and answering in almost any case if used as a film of from one to two centimetres diameter, is a solution of 175 grammes of sulphate of copper, 17 grammes of bichromate of potash, and 2 c.c. of sulphuric acid, in water up to 500 or 1,000 c.c. This solution will also absorb all the blue and violet rays.

*Writing Reversed Titles for Negatives.*—Mr. Eypert, a skilful amateur photographer, recommends to wash off the gelatine film of a spoiled Kodak or other transparent film negative, then to dry and to varnish it with quickly drying negative varnish, and to write the titles to be transferred with a hard pen and with Indian ink on the dry and varnished side of the film. After the lettering has dried, the film is pasted to the negative to be printed, surface down, so that the lettering comes into contact with the film side of the negative. After printing, the lettering will appear quite white in the finished print.

*Rapid Hydroquinone Developer.*—Professor Lainer has renewed his experiments with hydroquinone together with caustic alkalies and ferrocyanide of potassium, and he now recommends the following developer as the most energetic of all he knows:—

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... | 1,000 c.c. |
| Sodium sulphite ... ... ... | 80 grammes |
| Ferrocyanide of potassium... ... | 30 ,, |
| Hydroquinone ... ... | 10 to 12 ,, |
| Solution of potassium bromide (1:10 water) ... ... | 10 to 20 c.c. |

The mixed developer is said to keep better if 40 c.c. of pure glycerine are added.

*Solution B.*

| | |
|---|---|
| Caustic potash ... ... ... | 100 grammes |
| Water ... ... ... ... | 200 c.c. |

In the case of correct exposure, 60 c.c. of solution A are mixed with 6 to 8 c.c. of solution B. If, however, it is desired to treat with this developer a new and not yet known brand of plates, the following modification is recommended:—

*Solution A.*

| | |
|---|---|
| Water ... ... ... ... | ... 550 c.c. |
| Sodium sulphite ... ... | ... 80 grammes |
| Ferrocyanide of potash ... | ... 30 ,, |
| Potassium bromide solution, 1 : 10 | 10—20 c.c. |
| Hydroquinone ... ... | 10—12 grammes |
| Glycerine ... ... ... | ... 40 c.c. |

*Solution B.*

| | |
|---|---|
| Water... ... ... ... | ... 550 c.c. |
| Caustic potash ... ... | ... 50 grammes |

50 c.c. of solution A and 50 to 70 c.c. of solution B are

measured separately, and at first only 5 c.c. of solution B are added to the 50 c.c. of solution A. During development solution B is gradually added if required, the potassium bromide being also added in accordance with the development. This developer is recommended by Prof. Lainer especially for instantaneous exposures.

## PARA-AMIDOPHENOL AS A DEVELOPER.

BY DR. M. ANDRESEN.

In No. 1707, of May 22nd, 1891, the Photographic News published an article by A. and L. Lumière, recommending para-amidophenol as a developer for photographic purposes.

I desire to call attention to the fact that for some considerable time I have been carefully studying the said product, and similar developers, and that, as far back as the beginning of this year, I have in several countries applied for patents for the use of para-amidophenol and its homologes and derivatives for developing photographic negative images.

This invention is based upon experiments I made in order to find a connection between *the constitution of this and similar compounds, and their capacity to develop the latent photographic negative picture.*

These experiments were made with a large number of organic compounds, and have already led to results which may be of general interest. I will now briefly refer to them, and at some future time report upon them more exhaustively.

It is well-known that many organic compounds possess the property of reducing the salts of silver; but, on the other hand, the number of organic compounds reducing only salt of silver previously exposed in the camera, but leaving intact *non-exposed* salts, is comparatively limited. In order to arrive at clearly defined conclusions on this point, by way of experiment, I first tried substitutes of benzole and naphthaline of well-known constitution. . As to these substitutes, the effect of the amido group ($NH_2$), hydroxyl group (OH), and aldehyd group (COH), were in the first place to be taken into account. Experiments proved that *mono-substitutes do not exercise a reducing power on the latent photographic image.* When treated with aniline, phenole, naphthylamine, naphthole, benzaldehyd, &c., exposed gelatine films of bromide of silver were left altogether uneffected, even in the presence of caustic alkalis. Also the benzidine (diamidodiphenile) acted in this respect exactly like a mono-derivative. However, the property to develop the latent photographic image on gelatines of bromide of silver was clearly shown in the first instance by the di-substitutes. Experiments furthermore proved that, amongst many of di-substitutes, those containing the amido group and the hydroxyl group are especially important, whereas the aldehyde group, even in the presence of an amido or hydroxyl group (as in para-oxybenzaldehyde), did not exercise the least effect.

On the strength of the aforesaid, I would say that from benzole, on replacing two hydrogens by the amido group ($NH_2$), or hydroxyl group (OH), three types of developers may be derived, *i. e.*—

(1) Diamidobenzole (phenylendiamine) $C_6H_4 \ldots \begin{cases} NH_2 \\ NH_2 \end{cases}$

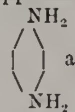
(2) Amido-oxybenzole (amidophenol) $C_6H_4 \ldots \begin{cases} NH_2 \\ O.H \end{cases}$

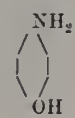
(3) Dioxybenzole $C_6H_4 \quad \ldots \quad \ldots \quad \ldots \begin{cases} O.H \\ O.H \end{cases}$

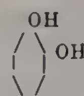
As is known, each of these compounds is represented in three isomeric modifications. I therefore took these facts into consideration when making my experiments.

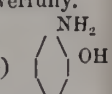
The compounds of the *para and ortho groups have now proved to be powerful developers*, whereas the three compounds of the *meta group did not exercise any reducing power at all* upon the latent photographic image.

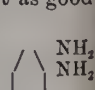
*Hydrochinone* (para-dioxybenzole), , belonging to the *para group* OH, has been used as a developer for several years.

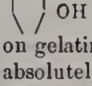
The application of *para-phenylendiamine* (para-diamido-benzole)  as a developer had been patented by me in Germany; however, I discontinued the patent, as this product did not act as a sufficiently powerful developer with carbonates of the alkalis, and, furthermore, because it easily produced a greenish veiling of the image when used together with caustic alkalis.

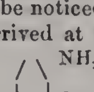
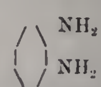
*Para-amidophenol* (para-amido-oxybenzole)  will be dealt with hereafter.

*Brenzcatechin* (ortho-dioxybenzole)  belonging to the *ortho group*, has repeatedly (first by Eder and Toth*) been recommended for developing purposes. On the strength of my experiment, I should that say this substance is in every respect at least equal to hydrochinone. Brenzcatechin will develop quickly, clearly, and powerfully.

*Ortho-amidophenol* (ortho-amido-oxybenzole)  is a fair developer, though, in some respects, not as good as para-amidophenol.

*Ortho-phenylendiamine* (ortho-diamidobenzole)  develops as well, but the isomeric para-phenylendiamine proved to be superior in regard to strength and quickness of developing.

As to the compounda of the *meta group*, Eder and Toth* have already proved that *resorcine* (metadioxybenzole)  will not do for developing photographic negatives on gelatino-bromide of silver. In my opinion, resorcine absolutely free from the two isomerics will not develop at all. On a plate of bromide of silver properly exposed under a negative treated with a solution of resorcine (1 : 50), to which were added four molecules of caustic soda, not a trace of a picture was to be noticed after three minutes.

The same result was arrived at with *meta-amidophenol* (meta-amido-oxybenzole), , and also with *meta-phenylendiamine* (meta-diamidobenzole), 

* Eder, "Die Photographie mit Bromsilber Gelatine," &c., page 101.

After thus proving that not only the compounds of the *para-group*, but also those of the *ortho-group*, exercise a powerful reducing influence on the latent photographic image, it was also of interest to study the processes of oxydation the various substances on their employment as "developers" are undergoing, and especially to get acquainted with the *final products of oxydation*. As to the para-compounds, they have been known for a long time, when oxydised, to get easily converted into chinon, $C_6H_4{\begin{matrix}O\\O\end{matrix}}\!>$, or chinon-like substances. That oxydation, on developing, actually takes place as above described I feel bound to conclude, because *para-amidophenetol*, $C_6H_4{\begin{matrix}NH_2\\OC_2H_5\end{matrix}}$, as I have proved, does *not* develop the latent photographic image. Nevertheless, the process is not a very simple one. The presence of chinon could not be proved in a hydrochinon developer exhausted through frequent usage. The oxydation of these compounds by means of bromide of silver in an alkaline solution apparently leads to different final products. I am now engaged with the investigation of these processes.

The capacity of the aforesaid ortho-compounds of benzole to develop the latent photographic image will have to be attributed to their being able, as lately shown by *Lincke* and *Küster*,* to form chinon-like substances, as has been known for some time with regard to certain ortho-derivatives of naphthaline, and is characteristically shown to be the case with eikonogen, .

As regards *para-amidophenol*, $C_6H_4{\begin{matrix}NH\\OH\end{matrix}}$ in particular, it should be premised that this compound is rather easily soluble in hot water, but comparatively difficult to dissolve in cold water. The para-amidophenol forms two groups of salts. With the aid of *acid*, salts may be got which mostly are *easily* soluble in water, and which, like hydrochloric para-amidophenol, $C_6H_4\begin{cases}NH_2HCl\\OH\end{cases}$, are distinguished by their great capacity to crystallise. From concentrated solutions of these salts, by an addition of carbonates of alkalis, the free para-amidophenol is precipitated. If still more diluted (f. i. 1:200), it will, however, remain undissolved even at the mean temperature of a room.

By means of *caustic alkalis*, salts are produced in which the hydrogen of the hydroxyl-group is replaced by metallic alkali, as, for instance, *para-amidophenolnatrium*.

$$C_6H_4\begin{cases}NH_2\\ONa\end{cases}$$

These salts are *easily* soluble even in cold water. It follows that with the aid of para-amidophenol, *two sets of developers* may be produced, viz., those with carbonates of alkalis, containing the para-amidophenol proper in a dissolved state, and those with caustic alkalis, where an alkalic salt of para-amidophenol renders them effective. *Both kinds may be said to be very useful.*

Para-amidophenolnatrium develops very quickly and powerfully indeed, the better sorts of dry plates in the trade, even without an addition of bromide of potassium, yielding absolutely clear and bright negatives, and showing the blue-black tint known as favourable for copying, which latter may also be obtained with hydrychinone.

* Reports of the German Chemical Society, xxi., 2719.

The following formula has frequently been used: Dissolve in 100 parts of boiling water 30 parts of metabisulphite of potassium, and hereupon 10 parts hydrochloric para-amidophenol. To this solution (which will keep) slowly add, whilst stirring, some concentrated caustic soda until the precipitated para-amidophenol has just been redissolved. For practical use, the solution of the para-amidophenolnatrium obtained has to be weakened by adding 5 to 50 parts water, according to whether a strong or weak developer be required. It may be seen from this recipe that only just as much caustic soda is wanted as is necessary for producing the sodium salt, which is important to know, since certain kinds of dry plates will not stand any surplus quantity of caustic soda. If carbonates of alkalis are used it will be necessary to weaken the developer considerably, owing to the para-amidophenol being difficult to dissolve.

The formula, as recommended by A. and L. Lumière, is, in my opinion, too concentrated. As a rule, I have successfully been working with a solution produced as follows:—

| | |
|---|---|
| Water ... ... ... ... ... | 1000 parts |
| Hydrochloric para-amidophenol ... ... | 5 ,, |
| Sulphite of soda (crys.) ... ... ... | 50 ,, |
| Carbonate of potash ... ... ... | 25 ,, |

This developer, it is true, works a little more slowly than that produced with caustic soda, but it has proved highly useful, especially for time exposures.

Para-amidophenol is thus a substance fully equal to any of the developers now used, but I would certainly give the preference to eikonogen—which, owing to its constitution, stands nearest to para-amidophenol—on account of its general usefulness.

## ADDRESS BY THE PRESIDENT AT THE OPENING OF THE AMERICAN PHOTOGRAPHIC CONFERENCE.

Possibly the best service I can render you is to speak concerning the present and the future of this Conference. In the first place, do not expect that a special national organisation such as this will bound into existence, rounded out and fully inflated like a rubber ball, in the first year of its beginning. Let us rather be content as we are, a small but earnest band of men and women, with the elements of health about us—stability and growth. In this way we can gradually grow up to the situation that we are creating for ourselves, and ready to meet each untried question that is offered for solution. We are now on trial as an experiment. You and I believe that there is a need for us, or we would not be here to-day; but we must show to the great army of camerists that this need applies to them as well as to us. Let us enumerate a few of the benefits that will accrue to the amateur from such an association. No one will deny that the camera club is a necessity to the uncommercial photographer. One cannot contain within himself all knowledge, all experience, limit the subject as you may. We learn from one another, and if a man is right-hearted, he is anxious to impart what he knows. It is true that we have teachers in books, and one may learn from them, but one may learn far more quickly from mental contact with the living teacher. A potent teacher is the work of others. In it you find a standard to measure the merits or defects of your own work. In this way you acquire one of the most valuable traits that make up the mental equipment of the artist—

an ability to be your own critic. There is an active mental stimulant in association. You try new things; you are no longer content with the simple view, but lantern slides, enlargements, transparencies, and new processes invite you into new fields, simply because you are in the atmosphere of these things. Now broaden your atmosphere from your own local camera club to the wide perspective of the Conference. You have simply left home and entered the world, with its variety, its unbounded interests, its grander energies. The best in your own home club will no longer furnish your standard of excellence. Here you will learn that there are master minds, as well as master hands, given up to the work of your chosen craft, and producing work that you would not dream of, except you meet it here. This skill, this art, could never be gathered together except in a national organisation like the Conference. What you had secured in your own club was a good home training; here you get a liberal education.

This personal contact has a more powerful influence in expanding the mind and diverting it into new channels than can be realised without a personal experience. Take my own case, for instance. Why do I feel the necessity of travelling half across the continent at a considerable cost of time, money, and fatigue, to attend a great medical gathering? Simply because I feel that I need it. I know from experience that it is one form of education in the great school of actual life. By this personal contact and mental friction between men in the same line of work, the little personal conceits, the mental eddies wherein the mind gets involved in a hopeless round, become straightened out. You lose your mental angles, and reach a larger and rounder intellectual life. If you believe you know a great deal about photography, come to the conference and find someone that knows more than you do. If you are conceited about the qualities of your picture, come to the Conference, and you will find in all probability a man who can make a better one. In this way you will not stay at home and be content, but you will go home resolved to do better.

So numerous and diverse are the applications of photography to science, art, manufacturing, and domestic life, and so rapidly is the field being widened in these directions, that it would be difficult to form a correct idea of how vast the field of heliographic science and practice really is, except as we are able to bring this multitudinous art within the fold of the Conference.

We are not an association of amateurs simply because we are here not in the interests of commerce. The debt of photography to the amateur calls for no expression from me before such an audience. Some of us are here in the interests of art in its best and widest sense; an art that always holds in the grasp of the vision the beautiful, the true, and the infinite harmonies of nature existing about us. Some of us feel this as an inspiration, with something of that desire that always comes to the æsthetic soul, to reach out and grasp with spiritual hands, and make all their own, something of that art which is eternal.

We have also among us the man of science, who finds that photography has made a pathway before him lit by sunshine. In its subtle chemistry, its delicate and exacting manipulations and ever widening possibilities, he is drawn onward, and finds here ample labour and full reward for the best years of his manhood.

The Conference may extend its influence beyond its own walls, and penetrate into the home-life of every club affiliated with it. The American lantern-slide interchange has done more to create an interest and establish a high standard of excellence among photographic clubs than any other agency that ever existed among us. Yet the number of clubs composing the interchange is necessarily limited. I do not see how it could be usefully extended beyond its present limit. If too many nights are given up to other clubs' work, your club might easily fall off on its trial nights and produce bad work from the need of individual competition. No slide that is worth submitting to the committee ought ever to find its way there without having been previously shown up in the club-room on regular trial nights. In this way you compare your work with each other, as well as having the best work of other clubs as a better and more exacting standard of comparison. This is one reason why I believe that lantern-slide interchange ought to be comparatively limited. Now I suggest that the Conference be divided into circuits of about ten clubs, by any way that may appear practical, each circuit exchanging slides for one year, when new circuits are formed at each annual conference. In this way all the clubs composing the conference will have an opportunity to become familiar with the work of the conference. Clubs already in the existing interchange could, if they saw fit, keep out of the conference interchange, as the number of clubs already in the conference furnish excellent material for two, if not three, additional interchanges. I would suggest that this matter be referred to a committee of the present Conference, so that the subject take practical form the coming winter.

An amateur, like a professional, is considerably exposed to the danger of working in a groove. He fancies that he cannot work but one plate with but one developer, or use but one printing medium. Now, if he is really to enjoy his art, he must be many-sided, and, while nothing can be said against liking the material one uses to the best advantage, yet one must have the stimulus of new things in order to broaden in a technical as well as an artistic sense. To that end, I would suggest that the members and clubs in the Conference institute a system of exchange of prints and finished pictures. In this way clubs will add to the adornment of their walls, and individual members enrich their collection. In this method of exchange a higher standard of criticism will be formed. New printing mediums and methods will be tried and become known. I venture the suggestion that this also be referred to a committee to put in working form. These are but a few of the factors that will draw the clubs and members composing the conference into firmer and closer alliance. We will surely find that we will work with a broader faith in the art possibilities of photography, and reach a more certain attainment of the possibilities in the union of our common interests.

Many—but, on the whole, friendly—criticisms have been made upon our constitution. It has been asserted that we are an exclusive body, by confining the governing power to the clubs instead of the individual amateur. But while I, for one, will disclaim any desire or attempt to create a class, or to favour one amateur to the injury of another, I will call the attention of our critics to the fact that the photographic clubs alone rendered such a body as this possible. Our constitution is a matter of experiment, as must ever be the case with new organisations in new and untried fields, and will require changes and modifications to meet the demands of growth and experience. I assure our friends that they will find members of the Conference who will always work loyally in the interests of photography, and not for individuals or clubs, ever ready to alter or amend our organic law, so as to popularise and extend the influence of the Conference.

And now I wish to thank you for the high and unmerited honour of having been made your first presiding officer. I have had but one thing, which I share in common with you, to recommend me for the place—a love for our art. I have been proud to share with you in the work and care, faith and trust, necessary to the inauguration of our Conference. We will live and we will prosper, for we are founded on truth that we know to-day as "photographic accuracy." We are the last nineteenth century phase of the old Magian worship of the sun, and believe in it not alone for its glories in form and colour, but for the truth it tells—truth so fixed and potent that the emotional æsthetic, or the astronomer who loves nothing warmer than the stars, must alike bend the knee to the gentler art. It thus becomes the sister of the instrument of precision, and with its eternal vigilance makes truthful record where human endurance and watchfulness would fail. In the depths of the ocean, or in the depths of space, where unaided senses falter, in every science and art where faithful record forms the material for the building up of that eternal thing called a fact, the camera and the dry plate make their faithful record; and, with these as our symbols, let us have faith.

Ely Van de Warker.

## FREEHAND DRAWING AND PHOTOGRAPHY.*

BY THE HON. J. G. P. VEREKER.

The purchaser of a microscope, very soon after he begins to use it, finds the necessity of making drawings of the various objects. This he does for the purpose of impressing the details on his mind, and also for making notes of interesting points of structure, either from his own slides, or from those which may pass through his hands from other sources, such as the Postal Microscopical Society. There are three methods of obtaining these pictures—namely, freehand drawing, tracing by means of a camera-lucida, and photography by means of a camera-obscura.

Freehand drawing is chiefly useful in making rapid sketches of simple parts during a continuous investigation of an object; but when a more finished representation is required it ought to be drawn to scale, and some mechanical aid is required. For this purpose, the most convenient instrument is a circular piece of glass ruled into squares (known as a net-micrometer), which is laid on the diaphragm of the ocular; the paper on which the drawing is made is also ruled into squares; by these means a copy of the magnified image can be made with a fair degree of accuracy. The scale is arranged as follows:—Suppose an inch objective is in use, magnifying 50 diameters, place on the stage a stage-micrometer, and, by means of the draw-tube, arrange so that one division of the net-micrometer corresponds exactly with $\frac{1}{100}$ of an inch; make a mark on the draw-tube at this for future reference. Exchange the stage-micrometer for the object, and make a drawing on paper ruled in squares, the sides of which measure half-an-inch. Then, it is evident, the drawing will be 50 times the size of the original in lineal measure.

For more exact and complicated work it is necessary to trace the magnified image as far as possible by means of one of the forms of the camera-lucida, and also to trace some divisions of the stage-micrometer on the same drawing, so as to make a scale; the drawing is then finished up by hand. The above methods are capable of doing very good work, but require a good deal of time, and, when a large amount of small detail is to be put in, are very tedious. There is also a tendency to make the work pretty and to flatter it, and if self-restraint is exercised in this matter, one does not always get credit for doing so.

The third method—viz., photography—is not open to these objections, as detail is given with great facility, because the lens represents all that is set before it, and, as for flattery, there is none; in fact, some people call it "justice without mercy." It is not, however, suitable for some kinds of work, and in that case hand-work is to be preferred.

The art of photo-micrography is not, however, so generally practised as it deserves, and this is not to be wondered at when one considers the cost of the cameras made for it, and the other paraphernalia generally recommended, which are enough to frighten many from attempting a process which may, after all, turn out to be unsatisfactory. For those who aspire to do the highest and most difficult work all this may be necessary; but for those who would like to experiment in the art, and who wish to turn out fairish work and get results good enough for ordinary purposes, a much cheaper and simpler apparatus will answer. Such an apparatus I shall proceed to describe, and, as I find it will work satisfactorily with my highest power ($\frac{1}{14}$ inch, by Nachet), I trust it may prove of use to others.

The first experiments I made in these cheap cameras were with a cigar-box as a camera. The long-shaped cigar-box will just take a $\frac{1}{4}$-plate ($3\frac{1}{4}$ by $4\frac{1}{4}$ inches), and its focal length is about 9 inches. I got a few fairish photographs with this apparatus, but found that it was rather too short, and also had to be covered with an opaque cloth to make it light-tight. I looked about, therefore, for something better, and found it in one of the deal boxes made for storing $\frac{1}{4}$-plate negatives. These boxes have a ledge inside to fit into the cover, and are, therefore, sufficiently light-tight for the purpose, and, being fitted with grooves, there is not so much danger from internal reflection; besides, these grooves enable one to alter the focus if necessary. Their length is also better, those holding 50 plates being about 13 inches internal measurement. They can be purchased at all photographic dealers, and cost from 1s. 8d. to 2s. each. Having got one of these, first of all paint it dead-black inside to guard against internal reflection. Bates' black, which may be obtained from the photographic dealer for sixpence a bottle, will answer perfectly. Now draw diagonals across at each end so as to find the centres at their intersection. At one end bore a hole the exact size of the ocular end of the tube of the microscope. The eye-piece, being then pushed into the tube from the inside of the box, will, by means of its flange, make a light-tight joint, and the box will be rigidly attached to the microscope and move with it in focussing. At the other end of the box a hole is likewise bored, either of a size to take a spare eye-piece, or else much larger, so as to enable one to use a focussing glass. As focussing glasses can be bought from a shilling upwards, the latter plan is most convenient; or an eye-piece with the eye-lens removed, and the field-glass next to the eye, can be used instead; but the focussing glass is preferable.

* Abstracted from the *Journal of Microscopy*.

Having purchased a box of $\frac{1}{4}$-plate dry plates, take one out of the box in the dark room and take it into your working room, in full day or lamplight, and cut a few lines through the gelatine surface with a knife; or, if preferred, a piece of glass of the same size can be used, with a few diamond scratches or paint marks on it. Now hold the marked side away from you, place the focussing glass against the other side, and carefully adjust the lens till you see the lines clearly and sharply, and make a mark on the brass tube so as to be able to reset it at any time. The glass is now adjusted for your eyesight, and should always be used at this focus. This work is easily done against a window-frame. Wash the emulsion off with hot water, and cut a piece of white and black cardboard the same size. Buy a ruby chimney for your paraffin lamp, or else get a dark room lamp, and make a shade or box so as to cut off the light from your paraffin lamp when changing plates.

The apparatus is now complete, and is used as follows:— The object is placed on the stage and focussed in the ordinary way; the eye-piece is now removed, the box is brought up to a level with the horizontal body of the microscope by means of books or a wooden stage, and the tube of the microscope is passed through the hole in the box and the eye-piece replaced. The piece of white cardboard is placed into one of the last divisions of the box, and, the cover being still open, the image is roughly focussed on the card, special care being taken that the illumination is evenly distributed. The card is now replaced by the sheet of glass, and the focussing finished by means of the focussing glass; or if this work is done by means of the spare eye-piece, it is pushed in till its diaphragm occupies the place where the sensitive surface of the plate will rest, the plain glass not being used in this case.

At this stage the diaphragm opening must be arranged so as to give the best image. It is also wise to give a final touch through a piece of blue glass, which can be supported on a cork sliding on the mirror bar, in order to allow for a difference between chemical and visual focus; this glass is then removed.

Now replace the white chimney of the lamp by the ruby one, or else cover up the light and work by the dark room lamp. Reopen the box and place the blackened card at the end, and put the sensitive plate (gelatine surface towards the microscope) in place of the plain glass, and close the box. Place a piece of card or brown paper either between the lens and the object, or the object and the lamp; replace the white chimney or uncover the lamp; remove the card cutting off the light, and make the exposure. Replace the card and remove the plate by means of the ruby light.

Several other exposures may probably be made without disturbing the apparatus by simply re-focussing; but, if much arranging is required, it will be simpler to take the apparatus to pieces. It is best to write the name of the object on the plate; this can be done with a lead pencil on the gelatine surface.

In order to get good results, the light and the centre of the plate must be in prolongation of the optical axis; the plate, if loose, must also be wedged in by blackened card or brown paper placed behind it in the groove. A small bit of wood, such as a match, glued on the bottom of the inside of the box, is a help in keeping the plate vertical.

One of the main difficulties of photo-micrography is the exposure, and this must be learnt by practice. There are many exposure metres and books in existence, and perhaps an instrument like Decoudin's photometer might prove of service, but I have not tried it for this work. The best exposure meter is the eye, judging the brightness of the image as compared with the white ground of the transparent parts; but colour makes a great difference: green, yellow, and brown require long exposures, and red very long. I annex a few exposures taken with an ordinary paraffin lamp, of $\frac{5}{8}$-inch wick, a small, cheap form of the Webster condenser, and Zeiss' projection ocular, magnifying three and a-half diameters; length of camera from eye-piece to plate, twelve and a-half inches.

| | Objective. | Stop of Condenser. | Exposure. |
|---|---|---|---|
| Proboscis of blowfly ... | 1-in. Swift ... | medium ... | 4 min. |
| Green Desmid— | | | |
| *Micrasteria denticulata*... | $\frac{1}{2}$-in. Verick ... | small ... | 2 min. |
| Pleurosigma angulatum | $\frac{1}{14}$-in. Nachet | semi-circular | 4 min. |

For ordinary work a $\frac{1}{4}$-plate ($4\frac{1}{4}$ by $3\frac{1}{4}$ inches) will be found most convenient, and from this size lantern slides can be made by contact. The plate ought to be of good quality and medium sensitiveness (about 20° Warnerke). In the development it is best to suit the exposure to the development, and not *vice versâ*—at any rate, for a beginner. Printing can be done by any of the recognised methods.

I trust that this slight sketch of the subject may induce some members of the Postal Microscopical Society to try this process, even though their camera may not rise above the cigar-box, as I am sure that they will find both pleasure and utility in it. A dark room is not a necessity, as any room or cupboard may be turned into a temporary dark room, so long as it is only illuminated by red or orange light. The magnifying power of the camera ought to be known, and this is best done by measurement in the ordinary way; but a rough approximate rule is as follows:—

Let L be the length of camera.

Let M be the magnifying power in use.

And X the required magnification.

Then as 10 : L : : M : X.

For instance, say L=12 inches.

M=50 (1 inch and A ocular).

10 : 12 : : 50 : $x$.

$\therefore x = 60$ diameters.

---

Solvent for Cellulose.—By C. F. Cross and E. J. Bevan (*Chem. News*, 63, 66).—The authors find that, by dissolving zinc chloride in twice its weight of hydrochloric acid, a solution of sp. gr. 1·44 is obtained, which dissolves cellulose instantly without sensible modification, and hence provides a useful solvent, especially suitable for the chemical or microscopical investigations of the vegetable fibres.

Reversal of the Image.—Mr. Paul Lange, of Liverpool, whose most successful pictures of Norway and Iceland are so well and deservedly admired, had a curious experience in his tour to the latter country last year. Many of his plates were put into the slides in a changing tent, which was, unfortunately, not quite light-proof for the special rapid plates. The consequence was many of these plates were light-fogged, and the point we wish to call attention to is this—these plates turned out to be positives on development, showing that not only does prolonged exposure in the camera produce this reversal of the image, but that supplementary exposure afterwards yields the same result. This is a good field for experimenters, and we trust some of our readers will follow the matter up. Such a clue leads to a large field for investigation, not requiring any great skill or any elaborate apparatus. It would prove a welcome change to the usual well-worn subjects as the subject for a paper at one of our society's meetings.—*Photographic Scraps.*

# Patent Intelligence.

### Applications for Letters Patent.

12,961. BENJAMIN JOSEPH EDWARDS, 45, Southampton Buildings, London, "Improvements Relating to Photographic Cameras, and to Appliances for Changing Plates or Films therein."—*July 31st*, 1891.

### Specifications Published.

3,392. *March 4th*, 1890.—"Hand-Cameras, and Shutters and Slides therefor." W. GRIFFITHS, Highgate Square, Birmingham.

The camera case is of cardboard, &c., coated with cloth, and strengthened with battens. It is provided with a hinged lid, which is fitted with a carrying handle and an ordinary finder. The lens is carried on the inner side of a perforation in the partition, the front side of which is fitted with a sliding spring-actuated shutter, the aperture of which serves also as a stop. The shutter is released by a lever, which is reached through an aperture in the base of the case. The front is closed by a flap, which is provided with an aperture. The dark slides are made up of cardboard, &c., leaves, and an intermediate leaf, which are secured together and hinged to corresponding leaves. Between both sets of leaves is a partition provided with springs to press on the sensitive plates. The aperture in the intermediate leaves may be adapted for lantern slides. The slides are fitted with sheet metal shutters, and are secured when closed by a sliding grooved catch. They are placed in the rear of the box, the front one being pressed forward by springs on the battens.

3,393. *March 4th*, 1890.—"Sensitised Films." E. W. FOXLEE, 22, Goldsmith Road, Acton, London. W.

This relates to the manufacture of sensitised films with celluloid supports for sensitive emulsion. A roll of heavily calendered paper is first coated with a waterproof solution, say of india-rubber, and then with a coating of gelatine containing chrome or other alum. When the gelatinous coating is dry, a fluid or plastic coating of celluloid is applied. After the solvents have evaporated the celluloid is coated in a dark room with the sensitive gelatino-bromide coating; and after the latter is dry a solvent for india-rubber is applied to the back of the paper, which is then stripped off by means of two rollers from the gelatine and the rest of the films. The celluloid support is left with a coating of sensitive gelatine on one side, and of insoluble gelatine on the other. This treatment has the effect of preventing curling. The backing of insoluble gelatine may be non-actinic if desired. The provisioual specification states that the compound film of gelatine and celluloid may be removed from the paper first, and coated with emulsiou afterwards. [Patent opposed. Case not yet decided.]

3,446. *March 4th*, 1890. — "Cameras, Change Boxes, and Shutters." A. P. RILEY, 249, Commercial Road, London.

To an endless band, at the back of the camera, are attached by clips plate sheaths; or the sheaths may be directly secured to the band. The plates are moved in succession to register against a lever by turning a handle on a roller, over which and an adjustable roller the band is stretched. To the roller is also attached a ratchet disc, pins, and teeth, on which move, through links, levers out of contact with the first and next succeeding plate. The last clip may be attached by a cord to a pivoted spring sector indicator, which exhibits through perforation the number of plates exposed. A modificatiou of the indicator consisting of a rack-and-pinion arrangement may be also used. The shutter may be actuated by levers. In the provisional specification is described an arrangement for actuating the shutter through the plate-changing mechanism, aud also a bag or case for the camera.

3,482. *March 4th*, 1890.—"Hand-Cameras." L. VAN NECK, Brussels.

Within a casing is a second casiug, the front lens carrying portion of which is movable, and is actuated by a rack-and-pinion. The flap shutter has a mirror in front, by which the image is reflected to the ground glass screen, the arrangement thus serving as a finder. To expose the plate, &c., which is placed in the rear of the camera, the shutter is lifted so as to clear the lens aperture. This is effected by a vertical spring lever, which, to set the shutter, is caused to ride over and engage with an arm on a pivot, the shutter, meanwhile, remaining closed. When thus in position the lever engages with a catch, which is released by a trigger arrangement. When the shutter reaches its topmost position the lever again rides over the arm, and the shutter drops at a velocity depending on the strength of its spring. For slow exposure the shutter may be lifted by a cord. The plates, &c., at the back of the camera are changed through a bag, the frame of which fits in an aperture covered by a lid, and is secured to the casing by a bail handle and the plate which enters a staple. A plate lifter at the back, which pushes up the rear plate to be grasped by the hand, also actuates an indicator disc.

---

THE LIQUOSCOPE; AN INSTRUMENT FOR COMPARING THE REFRACTIVE INDICES OF LIQUIDS.—By K. Sondén *(Zeit. anal. Chem.*, 30, 196—199*)*.—The apparatus consists of two similar hollow prisms, which are immersed, side by side, in a glycerol-bath, formed of a cylindrical vessel with glass ends. When both prisms are filled with liquids having the same refractive index, a horizontal black liue observed through them appears continuous; but if the indices are different, one part of the line is displaced with respect to the other. The instrument is very serviceable for indicating adulteration of butter, oils, glycerol, &c.—*Journal of the Chem. Soc.*

ACTION OF SUNLIGHT ON ORGANIC COMPOUNDS.—By H. Klinger and O. Standke (*Ber.* 24, 1340—1346; compare Abstr., 1886, 888, 1889, 405.—When a mixture of finely powdered quinone (5 grammes) and benzaldehyde (10 c.c.) is exposed in a sealed tube to direct sunlight, the yellow solution becomes darker, and greenish-black crystals separate, which increase in quantity as the quinone dissolves. No pressure is observed on opening the tube; the crystals are collected, washed with ether, and after crystallising from dilute alcohol, identified as quinhydrone. Dibeuzoylquinhydrone, $C_{32}H_{21}O_8$, is obtained when the filtrate and ethereal washings from the quinhydrone are allowed to evaporate in the sun. The black, semi-crystalline residue is spread upon a porous tile, aud dissolved iu dilute alcohol, when it separates in long, black, flat needles, having a bluish-violet lustre, and a brown colour by trausmitted light; it melts at 116—117°, and dissolves in alcohol, ether, and benzeue with a yellow colour, splitting up into its components (see below); heated with water, it melts, the browu drops gradually become lighter, and quinone passes off with the steam. Benzoylquinol (dihydroxybenzophenone), $C_6H_3Bz(OH)_2$, is obtained, together with quinol, wheu dibenzoylquinhydrone is heated with sulphurous acid; it separates in yellow, oily drops, which solidify ou cooling, whereas quinol remains in solution; it forms long yellow needles from dilute alcohol, and is very readily soluble in ether, benzene, and alcohol; it melts at 125°, and yields dibenzoylquinhydrone when a dilute alcoholic solution is mixed with one of quinone. The tribenzoyl derivative, $C_6H_3Bz(OBz)_2$, which crystallises from alcohol in glistening, white needles, melts at 118°, and is sparingly soluble in cold alcohol, readily in ether and benzene, is formed on treating beuzoylquinol with benzoic chloride; by hydrolysis with alcoholic potash, beuzoylquinol is regenerated. Isovaleroquinhydrone, $C_{17}H_{18}O_5$, is formed together with quinhydroue from quinone and isovaleraldehyde; it crystallises from dilute alcohol in beautiful red tables, with a metallic lustre, which gradually undergo change iu the air and become yellow; it dissolves with a yellow colour in alcohol, ether, benzeue, and glacial acetic acid, and melts at 103°. Isovaleroquinol, $C_4H_9{\cdot}CO{\cdot}C_6H_3(OH)_2$, is obtaiued together with quinol when isovaleroquinhydrone is treated with sulphurous acid; it separates from dilute alcohol in yellow needles, and from benzine in prisms, which become dull in the air, melts at 115°, and dissolves in alkalis with a yellowish-red colour; it combines with quinone to form isovaleroquinhydrone; the dibenzoyl derivative, $C_4H_9{\cdot}CO{\cdot}C_6H_3(OBz)_2$, crystallises from alcohol in white needles, melts at 105°, and yields isovaleroquinol on hydrolysis. The above-mentioned aldehydes have scarcely any action on quinone in the dark, less quinhydrone being formed after a month's action than by an hour's exposure to light.—*Idem.*

## Correspondence.

HACKNEY PHOTOGRAPHIC SOCIETY.

Sir,—The council of the above Society would esteem it a favour if you could find space in your next issue for the following announcement:—The council of the Hackney Photographic Society have decided to hold an exhibitiou on September 23rd and 24th, in the Morley Large Hall, Hackney, when, iu addition to an apparatus section and members' work, there will be an open class. There will be no subdivision of classes, such as architecture, landscape, &c.; the medals going to the best pictures irrespective of subject. Full particulars will be sent on application to the hou. sec., Mr. W. Fenton Jones, 6, Victoria Street, King Edward Road, N.E. S. H. Barton, *Assistant Sec.*

## Proceedings of Societies.

Richmond Camera Club.

At the ordinary meeting on the 31st ult., Mr. Davis in the chair, the subject for discussion was "Photographing Interiors."

Mr. Faulkner showed negatives taken in some of the apartments at Haddon Hall, with only one miuute's exposure, developed with eikonogen, and showing plenty of detail and superabundance of density.

Other members contributed to the discussion hints on levelling the camera, backing plates, exposure, &c.

Glasgow Exhibition.—As will be seen in our advertisement columns, the last date for entries has been postponed to August 20th. The last day for receiving exhibits is August 22nd.

A New Silvering Bath.—M. Dagreve, in *Les Annales Photographiques*, suggests the following method of silvering old plated or copper articles, which may be useful to auy chemist who has some old fixiug baths and some worn electroplate. The articles to be plated are well washed with soap and water, and then immersed in an old fixing bath which has beeu used for fixing plates. In a very short time a deposit of silver forms, and then the article should be taken out, rinsed, polished with a soft leather, and agaiu immersed till the deposited silver is thick enough. When an extra thick coating is desired, a piece of wire is affixed to the object, and at the other end of the wire a sheet of zinc, allowing one square centimetre of ziuc to every square decimetre of the article to be plated. It is not advisable to use old print fixing baths for this purpose, as the silver has a peculiar yellow tinge; but chloride of silver which has not beeu exposed to light may be used.

The Photographic Portraits of Thackeray.—A few words about the photographic portraits of Thackeray are necessary to complete the article given in our July number. During his visits to America (1852-3, 1855-6), in compliance with the wishes of his Trausatlantic friends, he posed before the camera, and the earliest of these sun pictures is a Daguerrotype by Brady, recently engraved for the *Century* magazine. In this, as well as other American photographs in the possession of Mrs. James T. Fields (reproduced in the "Unpublished Letters of Thackeray"), his appearance is rather quaint, owing to the style of his habiliments—such as the broad, turned-up collar, black or striped stock, and check waistcoat of the period. Of the many English photographs, mention must be made of "Thackeray in his Study," by Ernest Edwards, B.A. (1860), where he is seeu "old, white, massive, and melancholy," as his friend, Edward Fitzgerald, remarked; a scarce photograph by Dr. Julius Pollock; and the more familiar ones by the brothers Watkins, who had the honour of producing (for the Loudon Stereoscopic Company) the last photograph ever taken of him. This portrait and the very early bust by Devile were engraved for an article (in the Christmas number, 1889, of *St. Nicholas*) on the "Boyhood of Thackeray," written by his daughter, Mrs. Ritchie, who, with true filial affection, says, "All a lifetime lies betweeu two portraits; all its sorrows and successes, its work, and its endurance."—*Magazine of Art.*

## Answers to Correspondents.

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

C. H. Collings.—*French Photographic Periodicals.* Besides the new monthly illustrated review of M. Paul Nadar, *Paris-Photographe* (53, Rue des Mathurins), there are the *Bulletin de la Société Française de Photographie* (Paris: Gauthier-Villars et Fils, 55, Quai des Grands-Augustins), *Journal de l'Industrie Photographique*, *Moniteur de la Photographie*, *Photographie Industrielle*, *Progres Photographique* and *Revue Photographique*. The "Rapport du Congrès International de Photographie, 1890" (Gauthier-Villars et Fils), is an interesting document, which you may study as preparatory of the forthcoming conference to be held next month in Brussels. In the French language there is likewise the monthly *Bulletin de l'Association Belge de Photographie*, for which address M. Hector Colard, 55, Boulevard du Hainaut, Brussels (27 fr. aunum). All or any of the above may probably be obtained through Messrs. Williams and Norgate, 14, Henrietta Street, W.C.

C. E. W.—Your letter of 1st inst. duly received with thanks.

D. L. P.—*International Labels.* The black star of twelve rays on vermilion ground, with words of caution to douaniers, can now be procured from Mr. W. H. Walker, of the Eastman Company, 115, Oxford Street, W.

J. McL. (Newark).—*Photo-Mechanical Processes.* Either Mr. E. W. Foxlee, of 22, Goldsmith's Road, Acton, W.; or Mr. W. T. Wilkinson, of 3, Perth Street, Cheetham Hill, Manchester, would give instruction of the kind mentioned. The reticulated plates can be had from Mr. J. J. Ayling, 12, Crane Court, Fleet Street. Are not the round marks due to minute air-bubbles in the gelatine coating?

A. M.—*Silver Residues.* You cannot have seen the exhaustive article on the working up of silver waste which appeared in the *News* of July 24th, page 531.

C. B.—*Copyright Decision.* The reserved judgment on appeal in *re* London Printing and Publishing Alliance *v.* Cox, which was delivered on Monday last, is full of interest to artists and photographers, and teaches the uecessity of puttiug on the register of copyright the name of the veritable owner of the picture. The former decision was reversed by Lords Justices Fry and Lopes, carryiug a majority against Lord Justice Lindley on appeal, and against the previous ruling of Mr. Justice Vaughan Williams. A *photograph* had been offered to the proprietor of *The Queen* newspaper, who published it; meanwhile, the *original picture* had been sold to other parties, who again negotiated for its appearance as a coloured supplement to *Myra's Journal*, without, however, making the necessary alteration in the register, and so it was decided that *no one* was entitled to sue for the alleged infringement of copyright.

S. E. Y.—*The March of the Camera Men.* We have read the columu and a half in Tuesday's *Daily Chronicle*, but should not look to a popular account for a serious discussion of the competing iuterests of professionals and amateurs. Many more cameras and appliances are demanded, and much material is wasted, because of the "craze," which, after all, stimulates trade. Although alarm is said to be felt in some quarters, we hold that the failure of first attempts often leads to higher appreciatiou of professional services, and does not supersede them.

Amicus.—*Rain Water.* A slate cistern divided with a partition of porous ware is better thau the cask and stone filter. A conical bag of swan's-down calico (plush side inwards) makes a rapid filter, easily cleaned, and can be hung below the water tap. It should not be allowed to get dry, but answers best when kept constantly in use.

A. B. (Preston).—*Blisters.* Try the addition of borax to the fixing bath, and do not use this too strong.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1719.—*August* 14, 1891.



CONTENTS.



## PATENT OFFICE FEES.

We have more than once had occasion to remark upon the tax on ingenuity which the fees payable by inventors at the Patent Office undoubtedly represent. That the evil is one which is attracting notice from all quarters is well known, and, in some measure, that fact is an assurance that it will be remedied. No clearer indictment against the system which prevails has ever been formulated than was contained the other day in the speech of Mr. Leng, M.P. for Dundee. This gentleman took the opportunity of moving in the House of Commons the reduction of the vote for the Patent Office by the sum of £100, in order that he might plead the case for the inventors.

In the first place, it appears that the Board of Trade, with which branch of the Civil Service the reduction of the patent fees rests, can afford to relinquish part of the income derived from patentees, for, according to the last annual report, an excess of income over expenditure of no less than £108,000 is recorded. This sum, instead of being spent in some way for the benefit of inventors—by reduction of fees or otherwise—is sent to the Treasury, where it is absorbed into the general revenue of the country. We next find that the cost of a British patent is greater than in any other country in the world, with the sole exception of Germany. The British inventor is charged £154 for patenting an invention for fourteen years, while in America the charge is £7 10s. for seventeen years. But the American Patent Office does far more for this small sum that the establishment in Chancery Lane does for its unfortunate client. It undertakes a search through previous specifications in order to find out whether the would-be patentee has not already been forestalled in what he believes to be an original idea. Does the English Patent Office do nothing of this kind to take care of the interests of the blossoming inventor? Nothing whatever. If Brown, Jones, and Smith were severally to go to the Office to-morrow, and each apply for a patent for, say, bromide paper, or gelatine plates for photographic purposes, the Office would blandly take their fees and comply with their requests, and the entire farce of giving protection, which was not worth the paper upon which it was described, would be carried out, without a hint to the poor inventor that he was throwing his money into the gutter. The case we have cited will seem an impossible one, but anyone who will take the trouble to search through the volumes devoted to abridgments of specifications will find the same ideas patented again and again by different persons.

The heaviness of the fee charged at the English Patent Office can be better appreciated when the fees charged by different countries are computed for the number of years during which the patent rights exist. Measured in this way, we find that the United States charge 8s. 10d. per annum for 17 years; France and Italy, £4 per annum for 15 years; Belgium and Spain, £4 4s. per annum for 20 years; Russia, £5 10s. per annum for 10 years; while Great Britain, poverty-stricken Britain, is obliged to tax those to whom she owes so much of her greatness no less than £11 per annum for 14 years, or more than 100 per cent. more than the fees payable in Russia, and more than 2,500 per cent. than those of the United States. This policy of taxing inventors up to the hilt is as foolish as it is morally indefensible, for it checks inventive enterprise. If we refer to the number of applications made in this country in one year, and compare them with the number made in the United States, we find an extraordinary difference, namely, eighteen thousand in Britain against thirty-five thousand in America. Indeed, everyone in America is encouraged to exert his or her inventive faculties, and, as a result, we find that inventors, both male and female, arise on all sides. They flood our own markets with various clever *notions*, which we eagerly buy, and in doing so we say admiringly, "How clever the Americans are to invent such useful little things!" whereas it would be truer to say, "How silly our home authorities are to prevent these paying little things being invented here."

But perhaps the most telling argument against the authorities was employed by Mr. Leng when he said that "it was extremely inconsistent on the part of the Government to grant large sums on the one hand for technical education, and then, on the other, to tax those who were technically educated and were turning their technical education to good account"; and we are quite ready to endorse his statement that "instead of our Patent Office being a helpful promoter of inventions, it was a hard, niggardly, unsympathising tax collector, bent on screwing all it could out of the poor inventor, while aiding him as little as possible." The seconder of the motion also did well to point out that inventors as a class are poor men, and too often, in their difficulty in paying these heavy fees, they place themselves in the hands of richer members of the community, who eventually reap all the profits which may result.

Now, what answer have the Government to make to these charges of extortion? Very little, we fear, which will bring any comfort to the poor inventor. The President of the Board of Trade does not think that the country ought to look upon the Patent Office as a permanent source of income. This is certainly a hopeful statement as far as it goes. And, in his view, they should consider whether a reduction might not be made in the fees charged in the interval between four years and eight years, so as to extend the chief protection given for four years to a longer period. This is also a move in the right direction, but there is no present intention of making the entire sum charged more in accordance with the fees payable in other countries.

The estimated surplus of the Patent Office for the current year is estimated at £116,000, and we are told that the Government contemplate a large expenditure for the benefit of the service generally. This will take the form of new buildings in place of the inconvenient place which at present exists, and the improvement will more than swallow up the sum just quoted. This is the most favourable part of the speech for the defendants, and is a way of spending the inventors' fees which few will cavil at. But the assertion that the much-required more rapid issue of abridgments of specifications will involve further expenditure is ridiculous, for the work can very well be done, and kept up to date, by a couple of extra clerks. Even this expense would be avoided if each applicant were required to furnish with his specification an abridgment of the same. In this way the work would cost the Government nothing, and it would probably be very much better done than it would by those who are not interested in its correct performance.

We have reverted to this important subject of patent fees because photographers are as much interested in the matter as any other class of the community. It is only by calling attention again and again to any abuse which exists that there is a chance of remedying it, and this is one which cries aloud for fresh legislation.

---

The Meisenbach Company (limited) have removed their City office to 188, Fleet Street. Many improvements which have recently been introduced have brought their process to the highest point of perfection.

## PERSPECTIVE DRAWING AND VISION.

BY W. E. DEBENHAM.

In a characteristically insolent effusion—characteristic at least of one of the signatories—wherein Mr. Chapman Jones is advised "to study an elementary treatise on perspective and take some elementary lessons in drawing," my own "intellectural powers" are, by the help of misquotation, held up to ridicule, and "untrained and rash persons" are entreated not to make it necessary for the writers to waste time in educating them—Dr. P. H. Emerson and Mr. T. F. Goodall profess to reply to the criticisms which have been called forth by their theories concerning perspective and vision. If the intellectual powers of either party in the discussion were the matter in dispute, the judicious reader would probably take into consideration which side had, in default of argument, supplied its place by impertinence, bluster, and misquotation. Mr. Chapman Jones may, for all that has been shown to the contrary, be at least as well acquainted with the rules of perspective as the writers who so contemptuously assume him to be ignorant of them. Mr. Sutcliffe alone receives the doubtful compliment of being the only one capable of understanding Messrs. Emerson and Goodall.

If any further illustration were required of the loose and inexact character of Messrs. Emerson and Goodall's so-called "proofs," it may be found in the fact that the only two persons, so far as I am aware, who have supported their pretensions in public discussion—Mr. P. Everitt and Mr. T. R. Dallmeyer—have each found one of their proofs to operate in the reverse direction from that indicated by the authors. Mr. Dallmeyer says that pillars, to look vertical, should not be inclined inwards at the top, as stated by them, but the other way; Mr. Everitt finds that the door looks narrower instead of wider towards the top. Such a difference may be expected when the looseness of the direction is remembered. The observer is to look at the middle of a doorway. Now, according as the doorway is high or low, or the observer is sitting or standing, the line of vision, when looking at the middle, may be upward or downward. It has before been pointed out that, to obtain results at all comparable, that part of the door level with the eye, and not the middle, should have been directed. Mr. Everitt, however, though observing this more precise direction, still found the "proof" to work contrary to Messrs. Emerson and Goodall's assumption.

Messrs. Emerson and Goodall say that my demonstrations with the coin experiments were vitiated by the use of an eyehole, the effect of which is to cut off the portion of the field of vision causing the phenomenon to be observed. This is not the fact. The eyehole was made of such a size as to allow all the coins concerned to be seen at one view, and the verdict of the members of the Society present, with the exception of Mr. Everitt, was that the upper and lower coins appeared equal to each other. With the notched stick repetition of the experiment, as the upper and lower pennies are not in view simultaneously for comparison, and as no means are indicated for insuring equality of angle above and below, for which the eyehole provides, varying effects may easily be produced or imagined.

The introduction of the question of binocular vision is only calculated to mystify the matter. The difference of outlines to the two eyes of objects at such distances as are generally included in views is so small, that if both were included in a painting, the effect would only be to double the lines to a slight extent without, on the whole, materially enlarging or diminishing each particular object. It should be remembered, too, that the vertical dimension of any object is not in any case affected by binocular vision. If Messrs. Emerson and Goodall say that the lateral dimension is affected, and ought to be represented in a picture as so affected, will they state whether it should be by increase or diminution? Should a circular form, for instance, in any given part of a picture (since its height is not affected) be represented as broader or narrower than the circle? If they can settle this, how would they arrange, not for a single object, but for a series, filling up the picture? It is useless to say, "How a drawing is to be done we do not enter into," and to quote the names of Rembrandt and Velasquez. If the works of these painters really support the contention of Messrs. Emerson and Goodall, it should be possible for them to point out that they paint such an object as less, or such another as greater in width (vertical measure, as before stated, does not enter into the question of binocular perspective), than would be in accordance with mathematical perspective. Perhaps they will not object to a quotation from Reynolds: "An artist ought to see clearly enough to enable him to point out to others the principle on which he works." This is particularly true with respect to those who profess to upset accepted principles and substitute a doctrine of their own.

The writers say that they have answered my criticisms either directly or in reply to other critics. They seem, however, to have quite overlooked the observation that "if their proposition is true, that the lower half of the eye sees things on a smaller scale than the upper, and for this reason a perspective drawing surprises us by making the foreground objects look large, then such foreground objects as are above the distance should surprise us by appearing too small in the perspective drawing or photograph. Perhaps one of the most familiar instances of a near object above the central distance is that of a chandelier depending from the ceiling when the interior of a room is photographed." Do they maintain that such an object as a near chandelier does surprise us by appearing too small in the photograph, as it should do if their statement and explanation are to be accepted?

It may further be noticed that Messrs. Emerson and Goodall have not given any satisfactory reason why, assuming their proposition with regard to the eye to be true, the upper and lower halves of the eye should not see the photograph or perspective drawing enlarged or diminished in the same proportion that they see natural objects, and so why the photograph should not, after all, give a true rendering and impression to the observer.

If possible to find rational answers supporting their contentions in reply to the questions referred to in the last three paragraphs—*i.e.* (1) Whether a raised foreground object, such as a chandelier, really does surprise us by appearing too small in a photograph? (2) Why the alleged difference of the upper and lower halves of the eye in representing dimensions should not act upon the drawing or photograph as stated to do upon natural objects? and, (3) What is the alteration of form which a regard for binocular vision dictates as required in a drawing, since width alone, and not height, can by any possibility be affected by it?—Messrs. Emerson and Goodall would do well to adduce them. If such answers cannot be found, readers will be apt to look elsewhere than in the direction indicated by these writers for the "rash and untrained persons" who make it necessary to waste time in educating them.

## IDLERS ON THE BROADS.

BY E. J. H.

I trust that none of my readers will be misled by the title of this letter to think that those who took part in this excursion are idlers anywhere but on the Broads; in fact, we were all hard-worked and jaded toilers—distinguished members of Her Majesty's Civil Service, doctors, barristers, lawyers, and men of business—all joining to forget the cares and troubles of life in a week of idyllic enjoyment on the Norfolk Broads, where the postman's knock soundeth not, and the rush and turmoil of great cities have no counterpart.

Liverpool Street Station was our meeting point, and here eight of us assembled in time for the 3.20 train for Norwich. There was some difficulty in ascertaining what tickets we should take, some of us taking return tickets to Norwich, only to find that we saved nothing in cost, and might have taken single tickets without any extra expense. The chemical professor, who, in his usual careful way, had made a thorough analysis of all the possible combinations, triumphed over us all, and exultingly flourished a return ticket to Cromer in our faces, for which he had paid about two-thirds the price of a Norwich ticket. The Great Eastern Company, having evidently an Oriental idea of life, and looking upon pleasure as of far more importance than such follies as business, cater for the pleasure-seekers, and let the silly busy-bees who travel for business pay for those who, with a true grasp of the fitness of life, prefer the sweets and pleasures of unadulterated enjoyment.

Arrived at Norwich, however, unexpected trouble awaited the chemical professor, the ticket collector refusing to accept a Cromer ticket unless the professor would consent to journey to Cromer and back; but as dinner was ready, and the professor hungry, he naturally resented the idea of another three hours' journey, but, scorning to bandy words with the hired minion of the company, produced his card, which, with its long list of F.R.S., F.C.S., &c., &c., struck such terror into the trembling official that he made no further opposition, and would doubtless have presented him with a free pass for the rest of his life if we had not impatiently dragged him off to the hotel, where we were joined by the lunatic doctor, who came to look after us, and to inform us that there were still a few vacancies in the asylum for deserving cases.

After dinner several more members of the party turned up, one of whom had lost his luggage, and insisted on sending the hotel omnibus up to meet every train through the night. As this omnibus started from the hotel yard on to which our windows opened, and it was impossible to start the omnibus without shouts from the ostlers and great banging of the gates, sleep was out of the question, and an early start had to be made the next morning. In spite of this, one or two energetic members of the party got up at daybreak to photograph various objects of interest, including the cathedral and the chambermaid.

From Norwich we took the train to Acle, where we found two waggonettes awaiting us, which, being loaded with cameras, portmanteaus, and their human freight, looked like the baggage train of an invading army.

At Acle Bridge we found our two wherries, on one of which was our old friend Skipper Joe (who welcomed us with his usual genial smile) and his mate Arthur, to look after the creature comforts of the hungry passengers. The arrangements had been carefully made by our secretary, who had put the teetotal brigade in one wherry, the other being reserved for those who prefer the national beverage of the Scotch to the insipid decoction of the Chinaman. Skipper Joe was in command of the "Scotch" boat, and, though he is a temperance man, he is no bigot, and looks upon cherry brandy as a non-intoxicating beverage.

The stores which had been sent down were divided between the two wherries, a liberal allowauce of beer and whisky being put on board the temperance boat in case of sudden illness. We set sail, but our progress was not rapid, the wind being dead ahead, and quanting—or punting, as we Southrons call it—had to be resorted to. In this line the professor greatly distinguished himself, but had several narrow escapes, the quant having a playful way of remaining firmly imbedded in the mud, aud it was only by seizing the professor round the waist that he was saved from a watery grave, or from being left, like a monkey up a pole, as a warning to the rash. We presently sighted a strange craft with lovely houris on board (remember this is an Oriental tale). The Fitzboozer, enraptured, was seen to be kissing his hand to the lovely creatures. This fired the breasts of the Major and Signor Grogerino with a determination to supplant the teetotal Fitzboozer in the affections of the damsels; so, leaping on board, they seized the jolly-boat of the Fitzbooser and gave chase, alternately running into either bank in their mad endeavours to come up with the strange craft, and take them captive. After exhausting but fruitless efforts, they found that the crew of the boat had lauded at Horning Ferry, where they were regaling themselves with tea and strawberries, and other Eastern sweetmeats. After tea the wherries came up, the rest of the party having gone off in the sailing dingey to Rangworth Broad. The Major politely offered to show the ladies and their friends over the wherry; so all went below, the Major cleverly capturing the most beautiful of the peerless damsels, and keeping her near the door. After a short time, suggesting that one of the other maidens should play the piauo, and while all were listening to the sweet strains of music, he, unobserved, bore the maiden of his choice off to the other wherry, leaving the Signor Grogerino to entertain their guests. The Signor looking round, and seeing that, in the language of the East, he had been spoofed, persuaded the whole party to follow the errant pair, and found the euraptured Major basking in the smiles of his angel, seated cross-legged on a cushion at her feet, and feeding her with "Turkish Delight," which he apparently thought was the orthodox Eastern way of love-making.

The rest of the party returned shortly after, only to find that the angels had taken flight, and the place knew them no more.

The next day we sailed from Horning to South Walsham, and thence to Ludham Bridge. In the evening we left our craft aud walked over to Horniug Ferry, where we were greeted warmly by the fair Emily, who made tender inquiries after Doctor Pat, who seems to be much loved by all the maidens of the East.

On Monday, from Ludham Bridge to Stalham, *via* Barton, the Major, Buffalo Bill, and the Mad Doctor, sailiug in the Dingey, stopped ou the way, and got some interesting pictures of reed-cutters at work. As we approached Stalham, a stalwart figure was seen leaning against a rail, with a retriever by his side and a gun in his hand. One of the party suggested that it was Dr. Emerson, waiting for our only artist, and masses were promptly said for his soul; but it turned out to be only au inoffeusive gamekeeper, and our only artist breathed freely once more.

On the banks where we moored our craft were two of the most amiable donkeys, which made great friends with the major, and welcomed him as if he had been one of the family. This suggested to several plate-spoilers the title of an Academy picture to be called "When Shall We Three Meet Again."

An irate old woman, who might have been the witch of Endor, then attacked us with a most venomous wrath for having climbed over a gate, but the honied accents of Buffalo Bill soon appeased the dear creature and calmed her wrath. From Stalham we sailed to Potter Heighau, where the professor climbed the mast, and, from that coign of vantage, announced that he could see three pictures at once. This was not caused by over-indulgence in whisky, but was called forth by the beauty of the scene on every side.

The next day we left our wherries at Potter Heigham, and took a sailiug-boat to Horsey Mere, where we had a good stiff breeze, and thence up the dyke to Waxham, where we had a most excellent lunch at a pretty little house at the head of the dyke. After lunch we walked up to the sea coast, where the soul of our only artist was enraptured at the sight of his beloved sand dunes, and, having rigged up his camera with a fine sand heap in front, he departed to pace the sands in search of another equally poetic conception. The guileless Major, who had been dabbling in the sea, quite unconscious that the camera was making pictures by itself, an operation which he imagiued required a man to bury his head under a black cloth, and then stand with watch in hand counting the seconds, sat himself down at the foot of the sand heap, and leisurely dried his feet, aud put on his shoes and socks, taking things very easily, and being, perhaps, nearly ten minutes facing the very centre of the lens. Doubtless, a very charming picture, quite unexpectedly by the artist, will be the result.

Ou Wednesday we sailed with a fair wind from Potter Heigham to Acle, where our only artist and several more of the party left us and returned to town.

On looking over the stores, we discovered that a considerably larger quantity of beer and other gentle stimulants had been consumed on the teetotal wherry than on the other boat—a fact which might have caused some astonishmeut had we not already seen how kindly the Fitzbooser took to whisky straight when he paid a visit to our wherry.

Dr. Woolsey Jackboy, who had joined us on the previous day, remained with us, thus making a small but select party of five. The doctor kept us in roars of laughter by recounting some of his experiences, which, on the ground that fact is strauger than fiction, must certaiuly have been true.

Amongst others, one is certainly worthy of a place in history, as showing the ingenuity of the doctor, and the intelligence of the feathered tribe.

We were discussing the effects of anæsthetics, and the doctor informed us that, owing to the impossibility of administering chloroform to birds, he had been put to some considerable trouble in getting over the difficulty. It appears that he was suddeuly called by telegram to Northampton, where a friend of his had a raven suffering from cataract in the right eye. This raven was a great pet of the family, haviug lived with them for fifteen years, but was rather ferocious to strangers. The problem that presented itself was how to operate on the bird without the loss of an eye aud a finger or two. But the doctor, nothing daunted, devised a most cunning clamp for the bird's beak, and fetters for its legs; but a further difficulty presented itself. A bird has an extra eyelid of a horny substance, but, by a most ingenious effort of imagination, he constructed a hook of special design with which to hold the horny eyelid during the operation. The whole of these desigus were worked out and the instruments made while the telegraph-boy waited for the prepaid reply, which was sent off as follows: "Will come next train. Fee, fifteen guineas." All these beautiful instruments were, however, unnecessary, for the bird, being of a very intelligent nature, stood quite quietly during the operation, and, putting its head on one side, turned its eye at exactly the required angle, which made the operator's task comparatively easy. A perfect cure was the result. "But," said a sceptic, "how about spectacles?" "Quite so," said the doctor, "the owner insisted that these should be gold-rimmed, and pebbles had to be used in lieu of glass, as, from their greater hardness, they were less liable to be damaged when, in a moment of abstraction, the bird scratched its head with its claw."

Fifteen guineas certainly seemed cheap for so much ingenuity and skill, and we thought that the story alone was worth the money. Another very interesting story concerned two girls, cousins of the doctor, who had trained a pet monkey to such a marvellous degree that it was able to perform all the offices of a handmaiden, and several which do not usually fall to her lot.

The doctor was a great bather, but had a quite original way of eutering the water. Instead of taking a header like ordinary mortals, he leapt into the air with arms aud legs outstretched in front of him, and the first part of his anatomy to strike the water was that part which nature has generously provided for the chastisement of small boys. At his particular request, he was photographed by several members of the party with hand-cameras, and the resulting pictures will probably be exceedingly interesting to students of graceful motion.

From Acle we sailed by Ludham to Barton, and moored the wherry at Barton Staithe ; but, finding that we had a manure heap on one side, and a heap of weeds from the Broads on the other, we soon shifted our quarters. The doctor, who spent a somewhat restless night, and wandered about the cabin like a disturbed spirit, left early the next morning, accompanied in the dingey as far as Stalham by three of the party. On their return, we sailed in the dingey on Barton Broad, and on to Irstead Staithe, a very picturesque spot, which afforded much study for the would-be artists of the party.

On Friday morning we moved the wherry to the western part of the Broad, and moored to a post some considerable distance from the land, which we found much more pleasant than being close to the bank. We then sailed in the small boats to Irstead. On the way a somewhat amusing incident occurred. Signor Grogerino was rowing by himself in the jolly boat, and approached rather too closely a lot of cygnets ; the irate swan, resenting this behaviour, gave chase to the Signor, who pulled for dear life ; but the swan, with head thrown back and breast distended, continued the pursuit, and, in spite of the frantic efforts of the Signor, gained rapidly on the boat, when the Signor raised one of the sculls to defend himself, but in his excitement dropped the other scull, and was left to the tender mercies of the ferocious bird ; but the swan, satisfied with its victory, contented itself with flying on to the stern of the boat, and making for the focussing cloth, which was lying on the seat of the boat, which made the poor Signor think that his last hour had come. But the life of the good man was spared, and the swan, with cries of triumph and exulting pæans of joy, left the affrighted Signor to pick up his scull and pursue his way in peace. A photograph of this chase suggests a quite new idea for a picture of (Leader) Leda and the Swan.

Arrived at Irstead, we paddled up a narrow dyke much choked with weeds to Neatishead, a most charming little village beautifully situated at the entrance to Beeston Park. Here we had lunch at the White Horse, where the proprietor, Mr. Haylock, and his wife and charming daughters, make visitors so comfortable that when once they arrive they never wish to leave.

After lunch, the Professor and Signor Grogerino took some views in Beeston Park, while Buffalo Bill and the Major took things easy, and persuaded Mr. Haylock and his daughters to come for a row, and to have tea on the wherry. On the return of the others we set off, and, owing to the narrowness of the dyke, the Professor and the Major, instead of rowing, stood up, using their oars as paddles. In their efforts to catch the other boat they ran on to a stake, and the Professor took a header into the bottom of the boat, to the great delight of Miss Nellie, who enjoyed the joke more than the poor Professor, who was sadly shaken.

However, no bones were broken, so we started off again, soon catching the other boat, and, on reaching the Broad, hoisted our sail and took the other boat in tow, and were again pursued by the irate swan. The breeze was light, and our progress rather slow till we had nearly reached the wherry, when the wind suddenly increased, and we were going well through the water, when we quietly undid the towing-rope and left the other boat. The Signor Grogerino was the first to discover this, and the look of astonishment on his face when he found himself left was a study. After tea on the wherry, we took our visitors back to Irstead in the dingey, and had to row most of the way back, as the wind had dropped.

On Saturday some of the party went to Stalham for letters and telegrams, and in the afternoon we paid another visit to Irstead to try and induce the ladies to come for a sail in the wherry ; but this they were unable to do, as they had made other arrangements. We returned to our wherry in time for dinner, after which we sailed in the dingey—the Signor Grogerino in command—who, with a recklessness natural to his warm Southern blood, sailed gaily over mud banks and shallows, through reeds and sedges, and was with difficulty restrained from attempting to sail over the island. We got back in safety about midnight, and promoted the Signor to the rank of vice-commodore for his daring display of seamanship.

Sunday will probably be looked upon as the red-letter day the trip by those who were fortunate enough to take part in it. We sailed early for Irstead, walked to Neatishead, and brought back the ladies and their brother, and landed on the island, where the party were photographed in a series of artistic groups by the Professor. After lunch on board, we sailed all over the broad in the wherry, having tied our boats to a stake ; but the sail of the dingey was left up, and the wind, which had been very light, increased very considerably and broke the painter, and with the two boats in tow the dingey went gaily for a cruise on her own account. The Professor gallantly offered to plunge overboard to bring them back, but was restrained from the rash effort by the entreaties of the ladies, who implored him not to risk his life in such a dangerous enterprise. Luckily, another boat was sighted, with three men on board, who went in pursuit of the boats, and enjoyed a cruise on their own account.

The wind, which had been increasing, was now blowing half a gale, and we returned to our moorings. Soon after, we saw several men in a small boat, which was caught by the squall, and was in considerable danger of being overturned by the force of the gale. They attempted to lower their sail, but the block refused to run, and for some time they were in serious difficulties ; but, during a temporary lull, one of the men climbed the mast and cut the halyard with his knife, and let the sail come down with a run.

Our intention had been to dine in the middle of the day, but the man from whom we had ordered some ducks arrived minus the birds, and informed us that he had not yet killed them ; so we were compelled to put off dinner till the evening, and all hands were told off to shell peas whilst the unfortunate birds were suffering martyrdom. In the art of shelling peas the Professor greatly distinguished himself, and provided good ground bait for the fish by the number he dropped overboard.

After dinner on board, we took our visitors home in the dingey, after a day which we shall all long remember with very pleasurable recollections. The charms of the ladies, the excitement of the sail in the stormy gusts which constantly swept over the broad, the ever-changing effects of light and shade, the beauty of the scene, and marvellous cloud effects, all helping to make us all feel that it was a day to be jotted down in the tablets of our memories as one never to be forgotten.

Next morning we made an early start, sailing from our moorings to Barton Staithe at five in the morning, and after breakfast driving to Wroxham, through Neatishead, where Miss Dolly was seen, with her usual sweet smile, waiting at the door to bid us all good-bye ; and so ended a week's thorough enjoyment. A good boat, good company, and perfect weather, combined to make our happiness complete. And I may safely prophesy that we shall revisit the scene of our trip on the very earliest opportunity.—*Proceedings of the Camera Club.*

---

The National Gallery in Danger.—The perennial danger of the National Gallery from fire is a dread fact which the officials of the Board of Works should not be allowed to burke. The facts are simply these. The walls of the National Gallery absolutely touch, through a thin party wall, the highly inflammable buildings of the barracks behind. Such buildings, we all know, are a constant source of danger, and are often the scene of small conflagrations ; so that it is criminally careless to leave these priceless collections, which no wealth could replace, to the chance of destruction. Yet Mr. Plunket, in the full knowledge that within a few yards there stand as well the equally inflammable warehouses of Hamptons, the upholsterers, replies to questions asked in the House of Commons that he is willing to lay on a water-pipe with which to put out possible fires. Could anything be more short-sighted ? As regards this water-pipe, we can positively assert that the National Gallery authorities prefer to do without it. They are sufficiently burdened with the responsibility this danger of fire thrusts upon them, without incurring the further risks of damage by water. What should be done—and that at once—is perfectly clear : the barracks should be razed and the Gallery isolated. If, in accordance with Wilkins' original recommendation, the ground beyond, then occupied by dilapidated buildings, had been acquired, the proximity of the warehouses hard by would have been avoided.—*Magazine of Art.*

## THE PROGRESS OF PHOTOGRAPHY.*

BY ARTHUR H. ELLIOTT, PH.D.

Beginning with the apparatus of the professional photographer, we do not find any important advances. The cameras that were used a year ago hold their places in the estimation of the practical man. In the matter of hand-cameras, we note some quite unique improvements. In this respect the new film-carrier called the "Kamaret" is undoubtedly a marked advance in the utilisation of the space within the box to secure the most compact disposition of the parts. The roll is so arranged that it occupies the space between the cone of rays from the lens and the side of the box. By this method of disposition space hitherto not used has been made available. Coming to the use of plates in hand-cameras, the new magazine camera of Anthony embodies several new devices that are quite ingenious. First, the plates are made to come into focus automatically by means of a spring, and, after exposure, a single push on a button takes the exposed plate out of the way into a well, leaving another plate in place for further use. Second, after all the plates in the magazine of the camera have been exposed, the camera may be loaded up again by attaching a reservoir box to it containing a new lot of plates, which are readily transferred to the body of the camera by the use of a couple of slides. The empty box can now be used to hold the exposed plates in the camera, and these are removed by attaching it to the bottom of the camera, and, with the movement of two slides, the plates fall out to give place to those that are to be exposed afterwards. When we remember that all these transfers are accomplished in open daylight, we must confess that this is a decided advance in the construction of hand-cameras.

Yet another hand-camera is the "Hetherington." Here we have a camera using plates that are arranged pretty much as the leaves of a book. As each plate is exposed it is turned down out of the range of the lens, just as you would turn down the leaf of a book if it were placed upon its back closed. As each plate is turned down a spring brings a new one into place. This is a most ingenious piece of apparatus, but as soon as the plates are all exposed, you have to resort to a dark room to refill the plate-holder.

In the matter of lenses, by far the most important step has been taken by Carl Zeiss in the adaptation of the Jena glass to photographic lenses, and the construction of a lens in which the chemical and visual rays come to one and the same focus. Yet another improvement is the use of lenses so corrected that they may be used at very short focus and wide angle without the distortion hitherto encountered in lenses of this character. There is no doubt that this Jena glass, which has done such wonders in field microscopy, is destined to teach us some new things in the world of photography.

While on the subject of lenses, we must not forget to speak of the efforts of the English lens-makers to come to some understanding in the matter of threads and flanges of the lens-mounts. Although nothing definite has yet been accomplished, a report on the subject has been approved by the principal English lens-makers, and, with a little further modification, there is no doubt that a uniform screw-thread for the lenses of the same size, also a uniform thread for tripod screws, and a uniform system of marking the diaphragms of lenses, will be adopted by all the English makers, and probably by those of America, France, and Germany. If this can be accomplished, the photographer will be in the same position as the microscopist, in having all his lenses of the same size fit into the flanges on his cameras, or into adapters that also are uniform for all makes of lenses.

* Abstract of report presented at the American Convention.

While we are noting the novelties in photographic apparatus, a word about the new rival photographic operator is worth our attention; we mean the automatic photographing machines, where you put the nickel in the slot and get your picture taken, framed and all; but they are at present not worth more than a word, for all we have seen are easily distanced by the poorest tintype artist that visits the smallest country town. Nevertheless, these machines are the beginning of a series of inventions that will take the likeness of a sitter in front of them, and purely by mechanical motions as certain in their action as those of a clock. At present they are more of a curiosity than an innovation in photographic work.

Since we last met, quite a *furore* has been seen in the matter of "colour photography." Prof. Lippmann, of France, startled the world with the announcement that he had discovered the secret of taking photographs in their natural colours. After-developments proved that he had repeated the experiments of Edmond Becquerel—made twenty-five years before—except that he had used glass plates with greater success. Practically, his work is of little value, but it is interesting as a development of the theory of interference in light. The pictures he obtained are of the same character as the colours of the soap-bubble in the sunbeam, or the film of oil on water.

Working in the same field of research, Carey Lea has shown us some new wonders in the properties of silver chloride. Indeed, he has discovered that the basis of modern photography, the metal silver, is capable of existing in several distinct coloured modifications.

The Austrian photographer Verescz, who also experimented in the field of colour by photography, did work that is but a modification of the work of Carey Lea.

Some means of determining the actinic value of light in its relation to photography has long been a desideratum, and the English experimenters, Messrs. Hurter and Driffield, together with Capt. Abney, have arrived at some interesting results, showing that the exposure determines the gradation of the lights and shades in the negative. Incorrect exposure will not give an harmoniously graded negative, and furthermore, this incorrect exposure cannot be improved by a change of development. They have devised a method of determining the proper time of exposure, but at present the apparatus is more scientific than practical.

A much more convenient apparatus for the purpose of determining the time of exposure is the neat little actinometer of Ballard, which depends upon the measurement of the actinic power of the light on a subject by finding out how long the photographic—that is, the blue and violet—rays take to fade from a phosphorescent tablet that has been exposed to their influence. Its mode of operation is very simple. A small tube, blackened inside, has at one end a tablet of luminous paint so arranged that it hangs by a hinge, which allows it to be exposed on the subject for half a minute. The tablet is then closed over the tube, and by looking into the latter the time of fading to a standard tint, also in the tube, gives a figure that is a measure of the photographic power of the light reflected by the subject.

This same actinic power is modified by our use of the diaphragm in the lens. But here, also, some experiments of the past year have given us some new light. Dr. Michelke, of Germany, has shown that if we reduce the size of the opening in the lens to one-fourth, we shall have to increase the time of exposure not four times, as would be expected, but twenty per cent. more, or nearly five times. By using yet smaller openings we must add still more to the time, and with one thirty-sixth of the opening the time will have to be forty-eight times as long, or an increase of one-third the calculated time for correct exposures with a corresponding larger stop. In a word, if the time of exposure is correct with a stop of one inch, and it is desired to use a stop of one-quarter of an inch, we must increase the time of exposure not four times, but nearly five times.

Flash-light photography has many workers, and it is constantly being put to good use and its manner of application being improved. Various devices have been employed to overcome the hard shadows that were to be found in the first pictures made by its use. The methods of doing this are in the division of the magnesium powder into a number of small charges, rather than using it in one large flash. These charges are fired simultaneously by the use of a number of gas-jets that are made to impinge on pieces of gun-cotton on which is placed the magnesium, the projection of the many flames at the same instant being controlled by some device that regulates the pressure of the gas and increases it at the same moment at every jet. Pictures made by these methods are very hard to distinguish from those made by daylight.

The colour of the magnesium light is capable of much modification, and in this respect may be a most useful adjunct to the orthochromatic plates. Two German experimenters have applied this in photo-micrography, using a mixture of perchlorate of potash with magnesium, chloride of sodium, and tartrate of barium, with some excellent results.

The development of the photographic plate has received a good deal of attention during the past year. In the matter of developers there is not very much to report, but quite recently paramidophenol, a substance related somewhat to eikonogen, has been proposed as a new agent. Like eikonogen, it is not very soluble, and it is also rather expensive, but if it is found to have any decided advantage the chemist will soon find a way to make it cheaply. At the present time it is said to possess good developing powers, and its use gives no stains on the films. Compared with eikonogen and hydrokinone, it oxidises more rapidly than either. It is consequently more active than these developing agents. But its most important advantage is the fact that it will not colour the film, and can be used for a large number of plates in succession. It is said that as many as twenty plates may be developed in the same bath without causing the least stain on the negative. From these indications it would appear to be as rapid as pyro without its staining defects.

In connection with the subject of developers, the interesting experiments of Colonel Waterhouse deserve a moment's attention. He has found that, by the addition of a very small quantity of thiocarbamide to the developer of eikonogen, it is possible to produce a positive image instead of a negative one. This is a matter of small importance to the ordinary photographer, but to those who have to work the photo-mechanical processes it is a saving in the steps to be taken for the production of the final printing plate, for it saves the production of a positive from the usual negative.

Coming now to the printing processes, we must record the revival of the use of gelatine as a substitute for albumen, with more improvements than it has seen in many years. Aristotype paper has made some very important advances during the past year.

Platinum printing still holds its own with amateurs, and it would be a source of profit to the professional photographer in the better class of work if he would but take time to overcome some of the earlier difficulties. In Europe they are far ahead of us in this matter.

A new printing process was presented to the photographer by two English chemists some months ago, which depended for its action upon the change made by light in the chemical structure of a dye-stuff made from the colouring matter known as primuline. This substance has the curious property of uniting with different organic matters, and producing with each one a coloured print. If, therefore, we print in diazo primuline from a star-shaped negative, we can make each of the star rays of a different colour, by the use of different organic matters put on as developers in the form of paste.

The application of photography to astronomy continues to give the most wonderful results. Stars unseen by the human eye are detected by the photographic dry plate. And some recent photographs made in Sydney, Australia, show that the stars of the Milky Way are really larger than they appear to the eye through the telescope. This is due to the fact that they emit many blue rays which are invisible to our sight, but whose light affects the photographic plate.

Photo-mechanical printing processes have made important advances in colour printing, in which they are now producing some of the most beautiful work ever attempted by the aid of light and the printing press, and without the aid of the human hand.

Such is a very rapid survey of the advances of our art since we last met. In the brief space that could be given in such a report as this, many really important steps of progress have received but a word of mention.

---

The Eastman Company have issued, in connection with the late Buffalo convention, a very neat "Kodak Souvenir," which takes the form of an artistically got up pamphlet comprising a number of specimen prints on the three different grades of bromide paper issued by this enterprising firm. The pictures are of various dimensions, and have been printed by gas-light. They are designed to show the different sizes in which the kodak camera is now issued. The subjects chosen for illustration consist of various views of the Convention buildings at Buffalo, some capital instantaneous Niagara views, and last, but by no means least in interest, the Eastman Company's new works at Rochester, N. Y. With regard to these latter, we are informed that "the new plant consists of fifteen acres, on which four buildings are already in operation. The largest of these buildings is devoted exclusively to the manufacture of the 'Eastman Transparent Film'; the dimensions of the building are 300 by 100 feet, which will give some idea of the capacity for turning out this product alone. The other buildings consist of laboratories, emulsion rooms, carpenter and machine shops, boiler and engine rooms. The power house contains a 75 horse power compound engine, which runs two Eickemeyer dynamos—electricity being used throughout the factories for light as well as power to run all the machinery—and a 50-ton De La Vergne ice machine, which is employed to keep the emulsion and film rooms at a cool, even temperature. Space is left for other engines, as several other buildings are under consideration, which, when finished, will undoubtedly make this the most complete plant of its kind in the world."

## Notes.

However convenient the electric light may be for general domestic use, and valuable as many know it to be in the photographic studio and experimental laboratory, it has serious disadvantages when employed for lighthouses. During certain conditions of hazy atmosphere the electric light is not half so efficient as the gas and oil lamps which it has to a certain extent superseded, and in clear weather its light is so blinding as to be positively misleading to those for whose protection it is designed. Murmurs to this effect have long been heard, and at last the Shipmasters' Society has made complaints direct to the Trinity House authorities. They say that the glare of the light—that at the South Foreland is specially indicated—casts intense shadows, and produces a phantom-like appearance of hulls, masts, and sails, and it is suggested that its brilliance should be tempered by the use of coloured glasses. Another suggestion is that instead of the direct ray for the guidance of mariners, the beam of light should be cast upwards towards the clouds, making a veritable "pillar of fire," by which ships could easily be guided on their way. Lieut. Wells has recently been trying the effect of this method of projection at the Royal Naval Exhibition.

The hand-camera seems to be ousting to a great extent the ordinary quarter-plate from the market, and, while we regret that this should be the case, we cannot help seeing that for a time, at least, a rush in favour of the newer contrivance was inevitable. Many persons take up photography because it happens to be just now a fashionable craze, and, as the hand-camera seems to be the easiest form of the art, they purchase that description of apparatus in preference to that which apparently requires a little brain-work before its intricacies can be mastered. The better class of photographers—by which we mean those who pursue the art for the love of it—whether amateur or professional workers, know full well the far greater value of the old-fashioned camera, reserving the hand apparatus for special work.

In the meantime, the hand-camera mania is such a real boon to the plate-makers that they ought to erect a statue to those who originated the idea. More especially are they beholden to the devisers of those hand-cameras with rapid-changing contrivances, for it is the bearers of these things who use up—and we may truthfully say *spoil*—the greatest number of plates. When a man has to change his double back, and go through all the various motions necessary to taking a photograph with an ordinary camera, and when, moreover, he has the means of only carrying with him six plates, he treasures them up and takes care not to throw them away too liberally. Often he will, after focussing a view, decide that after all it is not worth spending a plate upon. Not so the gentleman who fingers his hand-camera. He presses the button—too often leaving others to "do the rest"—and hopes that each time he does so a picture is born to him. The temptation of firing away until all the ammunition is exhausted is a characteristic of inexperienced photographers, as it is of youthful soldiers.

A very cheap and efficient form of flash-lamp is described in a letter from Dr. Powell to *The Beacon*. To make it, one must procure a common flower-pot saucer, and perforate it with a hole at one side large enough to accommodate the stem of a "churchwarden" tobacco-pipe. The pipe is inserted into this hole from the inside of the saucer, and its bowl is cemented with plaster-of-Paris to the centre of the receptacle. A piece of cotton-wick, or asbestos fibre, is wound loosely around the bowl of the pipe, soaked in methylated spirit, and ignited. In the meantime the pipe has been charged with magnesium powder, and a length of india-rubber tube with a bulb at the end attached to its stem. Pressure on the bulb sends a puff of magnesium through the flame, and an intense flash results. The tobacco-pipe has before been utilised for flash-light purposes, but not so perfectly as in this case.

The chairman of the meeting of the shareholders in the Automatic Photograph Company, which was held a few days ago, had a very doleful tale to tell. We do not allude to the financial condition of the Company so much as to the working of the machine itself. It is useless now to disguise the fact that, as at present constructed, the apparatus will not work automatically. Each machine requires the services of an attendant, who, of course, must be paid, thus adding considerably to the expenses; but, even with the assistance of an official, the results were extremely unsatisfactory. As to the cause of this, we can say nothing, as one of the peculiarities of the prospectus was that the opinions of experts were carefully excluded. We may, however, mention that the chairman stated that there were at the present time no less than 150,000 bad plaques at the Company's office, so that the fault may not be altogether the machine's. Despite the miserable outlook, some of the shareholders think there is "something" in the apparatus, and are averse from winding up the Company. A committee has been appointed, and perhaps they may discover what the "secret process," of which so much has been made, is worth.

Admiral Gervais, who will shortly be the lion of Portsmouth, is giving a great deal of trouble just now. He has never faced a camera, nor has he ever allowed his features to be transferred to canvas. No doubt the difficulty will be overcome by our journalistic artists when they get a chance of sketching him; but this will not satisfy his admiring countrymen. In Paris enthusiasm always breaks out in shoals of the photographs of the idol of the hour being exhibited in the shop windows, and to find these barren of the portraits of the hero of Cronstadt and Portsmouth is a great privation.

There is an engaging simplicity about the following record in the official organ of the Manchester Amateur Photographic Society:—"The dark room has received some attention in the way of furnishing and completing since our last reference to it. A number of respectable-looking bent-wood chairs have been purchased, which help to give the room a more comfortable appearance." Photographers might take a hint from this. Why should one always stand in order to develop a plate? Providing the sink be of the right height, developing—especially in the case of dry plates—can be performed just as well by the operator sitting, while there is no doubt about the comfort. We have seen photographers fairly worn out after a long day's work, simply from the fact that they have never once sat down. Yet, as a sixth or so of the time was passed in the dark room, this proportion of rest might easily have been obtained.

## PHOTOGRAPHERS' AND ARTISTS' PERSPECTIVE.

BY ANTON M. HASCHEK.

Drawing and colouring combine to form an harmonious pictorial effect. They are the means by which the artist arrests the eye of the spectator, and they owe their origin and cultivation to the study of nature and the desire to imitate natural surroundings. When drawing according to definite rules was first introduced, a new factor entered into the perfection of the art—namely, science.

Not colouring, but delineation, and also the effects of light and shade, form the characteristics of photography. The absence of colouring shows, at the first glance, that photography, under ordinary conditions, remains very much behind painting. Its history also proves that it has arisen from the endeavour to reproduce natural objects—above all, the forms of human beings—and herein exists its principal application in portraiture. So far as it is a question of reproducing objects by drawing or by photography, the effect of each method is the same; but, as soon as either endeavours to work artistically, the distinction is manifest. The artist idealises, while the photographer only reproduces. It is not to be disputed that in the reproduction of nature, under favourable circumstances, a picturesque effect can be produced, and that by genius and taste the same may be essentially promoted. It shall now be our task to consider those rules which further the success of photography in an artistic sense. We have two means of doing this before us—the laws of perspective, and the study of the pictures of good masters. The principal aim in composing a picture is that the drawing, or rather the photograph, shall produce on the spectator an impression recalling nature itself.

In order to attain this end, it is necessary for the artist to study, on the basis of simple problems, the foreshortening and reducing of the lines consequent on the position of the objects on the plane. To the photographer this is not necessary, for his apparatus, supposing that it is an optically faultless one, delineates the perspective rightly automatically. We only need to put the eye into the same position as the lens in order that it may receive exactly the same impression from the objective point of view; but we are not accustomed to seeing from the objective, but from the subjective point of view. As we know from experience the real size of any object, we apply to them, when looking at them, other proportions of size than those which correspond to the actual appearance. Only one example of this assertion need be brought forward. As we know that the moon has enormous dimensions, it appears to us large—larger than all the other heavenly bodies. If different people are asked how large they see the moon, and are requested to give a comparison with some other object, very different answers will be received. One person will say, "I see the moon as large as a penny"; another compares it to a loaf of bread, and so forth. Therefore, the eye, in drawing, sees from a subjective point of view, and not from an objective one.

The following diagrams will illustrate this. The two towers in fig. 1 possess constructively the same dimensions, only one is drawn for the normal eye at a distance of twenty-five centimetres; the other for half that distance. If we look at them side by side, the first seems to be normal in appearance, while the other appears to be all out of drawing. This appearance is effected by the lines falling obliquely across the horizon; but if we take the precaution to look at the second tower through an eye-hole at a distance of twelve centimeters, we shall receive the same impression as the first drawing produces. Now, we generally look at pictures and drawings from a distance which is quite as great as or greater than this. Therefore, if we wish to produce the effect of nature through a picture or drawing, we must make the distance from the eye to be not smaller than twenty-four centimeters.

But there is still another thing which we must pay attention to: our eyes are only able to cover a limited space at one glance. Let us imagine the line of sight drawn from one edge of the picture to one eye; the size of the picture which is at once distinctly seen is thereby determined. But we must not let that hinder us from making larger pictures which we cannot see over at one glance, so that we are obliged to let the eye wander as we do in the contemplation of nature. But we have a second means of obtaining a general view in one glance; we choose a distant position—that is, we increase the distance of the picture from the eye. If we allow the eye to wander over the picture, and to contemplate part by part, and consequently see the picture with varying lines of sight, we shall fix now on places in the foreground, now on some in the middle distance, and now on others in the background, as in nature. Now arises the question, How shall we proceed as regards the sharpness of the picture? Shall we draw the foreground distinct, and the background misty and indistinct, because, in looking at

*Fig.* 1.

the foreground, we see the background indistinctly, and *vice versâ?* Or shall we make it all similarly indistinct? Neither. If we return to the contemplation of nature, we must grant to ourselves, after careful self-observance, that we see hardly anything indistinctly, but distinctly, and even very distinctly; for we do not see over a landscape with one glance, but contemplate part by part, and unconsciously accommodate the eye so that we see every part distinctly. This accommodation of the eye takes place so quickly that we are hardly aware of it, but get the same impression as when we are able to look over a large picture. But the fact that we are no longer in a position to recognise details has its reason, not in indistinct sight, but in the angle at which we see the object, and in the manner the light touches it.

If we look at the disc on a target, the circles and rings will appear continually smaller the farther we are from the target, and we shall even at last be able to attain a distance from which the target appears to us to be like a small white plate. Why? Because the thickness of the black rings makes with the eye an angle so small that we are no longer in a position to recognize details. If the eye could obviate this, telescopes and magnifying lenses would be superfluous; they serve not to enlarge the surroundings, but to enlarge the angle at which they appear. On the other hand, details are sometimes lost through bad light. The reproach that it makes objects too distinct is often made to photography; no painter would produce an object so distinctly as photography. This appears partly conscious and partly unconscious self-delusion. In a small photographic picture the details are lost, and even when they exist we do not see them at the proper distance of looking at a picture. It may happen even that large-leafed plants are found in the foreground so that in the picture the leaf-veins show—of course, with exaggerated clearness. The picture is not meant to be looked at with a magnifying glass, and with a proper choice of eye distance the details—which people are so fond of calling photographic clearness—vanish very rapidly. It is unfair to compare photographic pictures with paintings. The painter paints just as clearly, but with fewer details, because the picture is intended to be looked at from a greater distance, and thereby the whole effect is rectified. Not so photographs. We are not accustomed to hang the latter in frames on our walls, high above our heads, but to arrange them in albums, and to ornament the writing table with them, altogether to arrange them so that they can be looked at closely; and therefore they must be distinct, that is, full of detail.

There are, therefore, two universal rules for the photographer. To regulate his pictures for the proper angle of sight—that is, to avoid as much as possible taking the photograph at an angle—and not to work at too short a focal distance, is the one; and the other obliges him to produce pictures rich in detail. Distinctness and indistinctness, as long as the details are not blotted out, do not come at all into notice.

Let us now turn to the means which are at the disposal of the photographer in adjusting these difficulties. They are soon enumerated—choice of subject, its position, and retouching. These are all, except the purely mechanical means, such as the use of orthochromatic plates, ready-made developers, &c. With them may be ranked also the choice of printing process, which has important influence on the effect of the picture. Choice of subject and its position is possessed in common with painters in making a sketch. But how small are the other means compared with those of the painter. Apart from the fact that the painter can leave out what seems to him undesirable, and insert into his work figures, in order to heighten the effect—which last may be attained by skilful combination of negatives—he has, over photography, the invaluable aid of colour effects.

But to return to perspective. Unity of perspective is the primary condition of a picture; just proportion of size must be present; but a painter can obtain very beautiful effects by ignoring mathematical perspective, and practising what we may call artistic licence. One example shall explain this. When we wish to draw an archway symmetrically with other arches seen through it so that the right and left sides are identical, we must place ourselves exactly before the middle line of the opening, so that we see all the following arches in the background of the picture equally symmetrically. In fig. 2 the arches are symmetrically drawn. The point of sight, therefore, ought to be placed on the middle-line. If, however, you try to find the vanishing point on it, you discover that it has been removed to the side. Why has the designer turned aside from mathematical perspective? In order to avoid too complete symmetry, which would have an inartistic effect. More variety enters, in consequence, into the composition. This shifting of the vanishing point we often find in the pictures of the great masters.

Let us look, to select one out of a great many, at Raphael's famous cartoon, "Paul Preaching." Paul stands here on the Areopagus of Athens on a kind of public staircase, which occupies quite three-quarters of the space on the left hand of the picture. Statues, temples, palaces, &c., fill the background, but they are, like the figures, freely grouped; there is nowhere symmetrical calm, but life and movement, and the point of sight is placed somewhat to the right. This may be recognized by the vanishing point of the steps of the staircase, and has been purposely done by the artist to avoid the unpleasant fan-shaped arrangement of the steps, which would otherwise intrude itself.

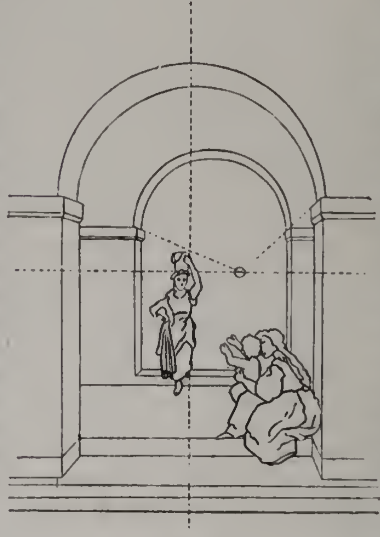


*Fig.* 2.

Further, we sometimes find two points of sight in a picture. In the "Decameron," by Winterhalder, in the left-hand corner of the picture a pavilion is seen over the summits of the trees. The lines of the sills and other horizontal lines vanish to a point which is different to that of the rest of the picture. But if the artist had taken the point of sight as the vanishing point of the picture, and held to the full view, the parts of the building lying in shade would have been visible, and the effect of the light architecture against the dark foliage would have been lost. Artistic licence with regard to perspective is made use of in a large measure where human figures enliven the picture. If perspective measurements are taken, we can often convince ourselves of the elongation of figures, as in the picture of Leonardo di Vinci, "The Last Supper;" the room here is hardly more than twice the height of

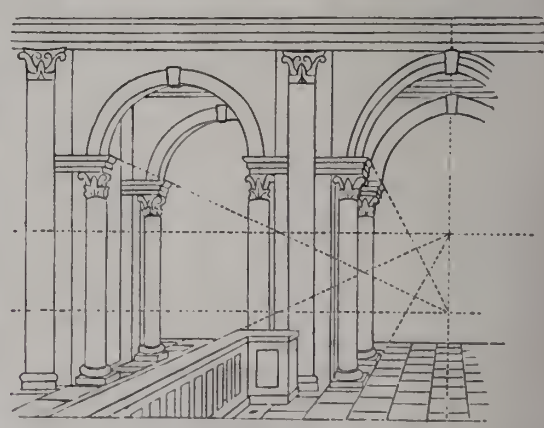


*Fig.* 3.

a man, while it is quite three times that amount in width. Nevertheless, the room makes a satisfactory impression, and does not appear oppressive. Again, Paul Veronese, in his picture of "Christ at the Publican's Supper," has brought a double archway into the middle line, and thereby obtained a perfectly symmetrical arrangement.

In the next example (fig. 3), we must imagine the drawing to the right transferred symmetrically to the left above the middle line. The weight of the arrangement in the original is softened by buildings strewn in the background. For the heads of the pillars and the arches above them and the shelves, the vanishing point is lowered to a considerable extent. The symmetry has thereby remained undisturbed; the pillars became thereby higher in appearance, and, as their bases are nearly covered by figures, the existence of the double point of sight is hardly discernible. Such cases of setting aside of the rigid laws of real perspective are not infrequent in painting. The artist will always exert a certain amount of licence if he thereby attains a more picturesque effect.

The photographer is, by his apparatus, bound to mathematical perspective. He cannot make use of the tricks of the painters, and is, therefore, inferior to them in resources. When, therefore, photography enters into competition with art in the shape of drawing and painting, it can only attain success by unusual skill.

It will be seen that I have endeavoured to show that photography is not only behind painting because of the absence of effects due to colour, but that its boasted absolutely correct lines, instead of representing an advantage, may often be looked upon in the opposite light. The photographer is far more dependent upon the perfection of his models, whether landscape or figures, than the painter can ever be.—Abstract translated from *Photographische Rundschau.*

## LONG DISTANCE TELEPHONING.

BY LUKE SHARP.

This is a story of the Camera Club.

The Camera Club in London, as everybody may not know, has now fine new premises near Charing Cross, ever so many stories high, of red brick outside, and filled with dark rooms and all sorts of luxuries inside. Among other things which the new building has which the old has not, is a telephone, which stands in the lower hall for the use of the members.

When a London club attains the luxury of a telephone, it at once takes rank among the leading institutions of the kind in the metropolis.

This story is the narrative of the fraudulent use of that telephone by one of the members, Mr. Pyrogallic H. Kinone, and as I have brought the matter to the attention of the committee, and as they have done nothing to punish Mr. Kinone, I think it only right to make the whole thing public. I do not think that a telephone is put in a club hall for deceiving an innocent New Yorker.

Pyro, as we call him for short, is a very popular member of the Camera Club. Perhaps that is why they do not deal with him as he deserves. He was over in America a year or so ago, and the Camera Club of New York treated him very nicely indeed. It seemed, however, that Mr. Hiram Waddell, of New York, played some sort of a joke on Kinone, a sell of some kind, and so Kinone swore to be even with him.

Not long ago he met Waddell in the Strand, and took him up to the club, where they had a long talk over New York matters and things in general, and he invited Waddell to lunch with him at the club the next day at a certain hour. Mr. Kinone asked about all the photographic boys in New York, and, among others, of John L. Vain. Pyro had liked Vain very much, and he asked Waddell if there was any chance of his being over this summer.

Waddell said there was'nt the slightest. John V. was interested in some big thing out west; he had seen him just before sailing, and Vain had said he wished he could get over to London this summer, but could'nt.

Shortly after this conversation Pyro was down at the Hotel Metropôle, when who should he run against but John L. Vain.

"Bless my soul!" he said; "London is full of Americans. I was just talking about you yesterday. I met Waddell on the Strand and took him up to the club, and I was asking if there was any chance of you coming over, and he said there wasn't; that you were going out west."

"Oh," said Vain jauntily, "I fixed that out west business all right, and I've come over to syndicate it if I can. Just got in to-day. Where's Waddell staying, do you know?"

"He is staying down at the Royal," answered Pyro.

"Well, I must call in and see him. I saw him just before he sailed."

"So he said. Look here, Vain, I want to fix up a sell on Waddell. You remember the one he got off on me in New York. We are going to have a lunch at the Camera Club to-morrow. Couldn't you join us?"

"I will be most happy," said Vain.

"Well, then, I'll get him up there about one o'clock. Can you be at the telephone here at the Metropôle at one o'clock to-morrow?"

"Certainly."

"Well, I'll call you up and turn you on to Waddell, and make him believe we have got a telephone line from here to New York. Do you understand? You think over it and fill him up. It will be a good story to tell the boys when you get back."

"I'll do it," said Vain heartily, and he did.

Kinone was to meet Waddell at Low's exchange, and they walked together to the club.

"I've just been telephoning over to Paris," said Kinone. "Have you seen about the Paris telephone?"

"Oh, yes, I read about it. Still, we do longer distance telephoning than that in America, you know."

"Ah, yes, but this Paris line, you understand, goes under the Channel."

"Well, I don't see that that matters much, does it? I believe that we telephone from New York to Chicago sometimes."

"Yes, I presume you do. Still, of course, that's all nothing to the Atlantic telephone from here to New York."

"Telephone? Cable, you mean."

"No, I mean telephone."

"Thunder! I never heard of a telephone under the ocean."

"Oh, you're behind the age. You've been out of America for a week. You are not up to the latest snap in electricity. Didn't you hear anything of Edison's new telephone before you left America."

"Oh, Edison's new telephone is an old thing, but I never heard of any attempt to telephone across the Atlantic."

"Attempt! Great heavens! You are not so far behind the lighthouse as all that, are you, Waddell? Why, bless me, you can ring up New York from any telephone in the city."

"Oh, you can't expect me to believe that," said Waddell.

"Believe it or not, as you like. I suppose if seeing is believing, hearing is believing as well. Here we are at the club. I will ring up New York, and you can tell me the names of any of your friends you want to communicate with."

"Oh, this is ridiculous," said Waddell.

Pyro made no answer, but he rung up the telephone. "Give me No. 15768." That was given him.

"Hello, switch me on New York, will you? Using the line? Well I'll wait a moment—Yes—yes—all right—give me New York—New York City. Is that New York?—I say, is that New York? All right."

"Now, then, whom shall I call up?" he said turning to Waddell.

Waddell was speechless.

"Tell me any of your friends; where's—who's your partner, by the way?"

Waddell gave the name of his partner. And then he shouted: "Give me Waddell & Co., Waddell & Co. Is Martin there? * * Oh, uot come down yet, all right."

"Not come down, nousense," said Waddell; this is after one o'clock."

"Ah, but you must remember it is a great deal earlier in New York. Say, what is Vain's address? Where's his place of business?"

"On Broadway. Harrison & Vain, you know."

"Say, give me Harrison & Vain * * * Harrison & Vain, Broadway—I don't know the number—Yes, is that Harrison & Vain? * * * This is London. * * * Yes. * * * England, of course. * * * Is Mr. Vain there?—Well, would you just ask him to step to the telephone for a moment? * * * Well, tell him Mr. Waddell, in London, wants to speak with him. * * * Tell him he'll only keep him a moment. * * * At his letters? Well, uever miud that. You tell him that we can't hold the line here all day. Ask him to come to the phone. * * * Oh! is that you, Mr. Vaiu? This is Pyro Kinone, of London. * * * Yes, Waddell's here. * * * Will you speak to him? * * * Certainly.

"Here you are, Mr. Waddell," and the astonished Waddell put the receiver to his ear.

"Hello, Waddell, is that you?" said the voice over the wire. "How did you get over? Have a nice passage?"

"Great heavens, Vain!" he said, "You don't mean to tell me that that's you?"

"Yes, can't you recoguize the voice?"

"Yes, by Jove I do. Say, I wouldn't believe this was possible."

"Oh, we've had this going for a week. Just started it after you left. Didn't you hear about it?"

"No, I heard nothing about it. How did that western speculatiou of yours turu out?"

"Oh, all right. I was out west just after you left and fixed things up most satisfactorily. Going to make some money out of that."

"Why, I can hear you as plainly as if I were talking from your office on Wall Street."

"Yes, it seems to work first-rate—that invention of Edison's is a great thiug. I met Edison this morning—he was in town early—and he tells me that he believes he is going to knock out telegraphing altogether."

"Well, I believe he will, if it's as successful as all this comes to."

Then Vain pumped him full to his horror about a great number of failures in New York, of men that he knew, and men that he was in intimate associatiou with. His jaw dropped as he listened.

"By gosh!" he said to Pyro, "New York's going to smash. I'll have to get back."

"Well, not before lunch, anyhow. Ring 'em off aud we'll come up and have lunch."

So they went up together into the dining room.

"Well, I can't get over that," said Waddell, "that beats the old Harry."

"Oh, American invention is a wonderful thing, you know," answered Pyro.

Just at that moment the waiter said: "There is a geutleman here asking for Mr. Kinone."

"Oh, yes, ask him to come in," said Pyro—and in walked John L. Vain.

"Hello, Waddell," he said, "how about transatlantic telephoning? I guess I rather set you up on failures, didu't I?"

"You two villians!" cried Waddell; "but haug it, I'm relieved to find that things are not as bad as I thought. I guess, Kinone, this is my treat. It's an English invention that is the wonderful thing this time."—*Detroit Free Press.*

---

Mr. W. England has called our attention to the fact that at the late photographic exhibition at Brussels he was the juror appoiuted to look after Euglish interests. We may add that his abilities as well as his name fitted him for the distiuguished positiou.

## CONVENTION OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

The proceedings were opened by President Hastings in Buffalo, N.Y., on July 14th.

The address of welcome was given by Mr. McMichael, who, in the course of his remarks, said:—

Our art is not an attempt to reproduce nature, but to exemplify all that nature suggests aud teaches as possible to humau effort. Nature needs no helpmate, but does welcome co-operation in enlistiug man's admiration and man's enjoyment of existing things. And so anything which helps to keep alive the features of departed frieuds helps also to contiuue to revive the best influeuces of their lives, and must consequently be beneficeut in its effects. The work of the photographer makes this beneficence universal, for in all homes, from the most luxurious to the most humble, it may be availed of at will. Though this is only oue of its values, it alone is a reason why everything that may contribute to the improvement and perfection of our work should be sought. And if in other callings the workers find help by association for their mutual improvement, certainly our patrons and the public have a right to claim aud expect that photographers should seek to learn, by association with each other, the best methods and the surest means to the best results in the pictures we produce for their approval.

The report of the Committee on the Daguerre Memorial followed, with a statement of accounts in connection therewith. Other routine business was succeeded by the delivery of the President's Annual Report, from which extracts are appended:—

The art principles we are trying to inculcate into our Association by the awarding of special prizes, which will draw out latent talent, embraciug the ideal, the poetic, and the art of composition, will be seeu by coutinued competitions, and I think the public will appreciate and acknowledge it iu au approving manner. Do not give up the idea that, if we are not able to conceive and execute in a manner which will give us a standiug approaching a Meissonier, or any that might be named; we surely do not want to be simply machines, controlled by our patrons' whims, but to rise higher and higher, and be accorded the praise and credit belonging to us. Many are in the work without any love for the art aside from getting a living, and too often those who are trying to reach the high standard desired are baffled thereby by lack of patronage, because the scum of the profession are working at an inconsistent remuneration. Merit will demand recognition, eveu though it may come slowly. Persevere, and the goal will be reached.

In our profession we are unjustly taxed for fire insurance. The rate established when, we will allow, the risk was more hazardous, has not beeu decreased in proper proportion, and I think this Association ought to raise its voice against such exorbitant rates, and act in accordance with the proper authorities.

The second day's proceedings included communications and congratulations, various reports and discussions, and remarks by Mr. C. Gentile, of the Committee on the World's Fair, in which, suggesting the appointment of an advisory council, he stated that the Association had a large list of distinguished photographers throughout the world. and that it would not be difficult to name the committee. It was agreed, after discussion, that a committee of five be appointed as an advisory council to confer with the World's Fair authorities.

On the third day, Mr. Scandlin presented and read the "Report on the Progress of Photography" (see page 574) on behalf of Dr. Elliott.

The opinion has been generally expressed that, although the number of exhibits was smaller than usual, the standard of excellence was higher.

[The foregoing particulars are gleaned from *Wilson's Photographic Magazine.*]

## PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The annual exhibition of the Society will open at the Gallery of the Royal Society of Painters in Water Colours, 5a, Pall Mall East, on Monday, September 28th, and will close on Thursday, November 12th. It will be inaugurated by a *conversazione*, open to members and their friends, at 8 p.m. on Saturday evening, the 26th of September, and will remain open daily (Sundays excepted) from 10 a.m. till 5 p.m. It will also be open on Monday, Wednesday, Thursday, and Saturday evenings, on which lantern slides will be shown from 7 to 10 p.m. Admission to the day exhibition will be one shilling, and to the evening exhibition sixpence. Members have free admission at any time, and will be supplied with as many tickets as they may require to admit their friends to the day exhibition, and with not more than twelve tickets for the evening exhibition.

Medals will be placed at the disposal of the judges (Messrs. J. E. Austin, F. Hollyer, P. H. Newman, F. M. Sutcliffe, and J. B. B. Wellington) for artistic, scientific, and technical excellence of photographs, for lantern transparencies, and for apparatus.

The following are the regulations:—

*Photographs.*—Each exhibitor must fill up the entry form supplied by the Society, and send it to "The Secretary, Photographic Society of Great Britain, 50, Great Russell Street, London, W.C." At the back of each frame must be written the name and address of the exhibitor, with the title or description of the photograph, and the number (if there be more than one) to which it refers in the entry form. Each frame or picture may have the exhibitor's name, and the title of the picture, neatly inscribed, and this only. Oxford frames and photographs already publicly exhibited within the London Postal District will not be admitted. Negatives and transparencies, photo-mechanical prints, photographs of purely scientific interest, and photographs coloured by scientific or mechanical means, will be admitted. Photographs coloured by hand will not be admitted. Lantern transparencies should be fitted in a frame to stand upon the table; if not removable, duplicates should be sent for exhibition in the optical lantern. Lantern slides will be eligible for award only when both the negatives and slides are the work of the exhibitor. With any work produced by a special process of the exhibitor, information as to particulars should be communicated.

*Photographic Apparatus.*—Each exhibitor must fill up the entry form supplied by the Society, and write a concise description of each piece of apparatus. A removable card must be attached to the exhibit containing the name of the exhibitor and the number to which it refers in the entry form. Attention is requested to this regulation, as, without it, the description of the apparatus may not appear in the catalogue. The exhibitor should fasten on each exhibit a small adhesive label, containing his name only. Apparatus and appliances that have been already shown at London exhibitions may be refused, and also those that do not contain some points of special interest (to be mentioned by the exhibitor on the entry form).

*Charge for Wall Space.*—No charge will be made to members of this Society; but to non-members a charge of one shilling per square foot will be made for wall space, the minimum charge being five shillings. Postal orders to pay for the wall space required by non-members must accompany the entry form. Should any of the photographs not be hung, the due proportion of the amount will be returned. The charge for wall space to those exhibitors who may be proposed as members of the Society at the November or December meetings will be remitted, and the amount paid credited to their entrance fee and subscription for 1892.

*Charge for Exhibiting Apparatus.*—As the apparatus will be under the personal supervision of a competent attendant, who will be ready to furnish explanations to visitors during the whole time the exhibition is open, a fixed charge will be made of five shillings to members, and ten shillings to non-members, which must be enclosed with the entry form, or the exhibit will not be received.

*Price Catalogue.*—A list containing the prices of pictures and apparatus to be disposed of will be laid on the table. It is desirable that exhibitors should state the price of their pictures on the entry form, as frequent enquiries are made respecting the prices of framed and unframed copies. Ten per cent. commission will be deducted on sales.

*Foreign Exhibitors.*—Foreign exhibitors are specially invited to contribute. The Society will pay the carriage of photographs one way, and provide frames during the exhibition for photographs approved by the judges. There will be no charge for wall space.

*Reception of Exhibits.*—Exhibits sent in packing-cases must be carriage paid, and addressed to "The Photographic Society of Great Britain, c/o Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London." Packing-cases must arrive not later than Monday, September 14th; they will not be received after that date. No packing-cases can be received at the Gallery. Exhibits, including pictures, negatives, transparencies, lantern slides, apparatus, and appliances, sent by hand will be received at the Gallery, 5a, Pall Mall East, only on Wednesday, September 16th, until 9 p.m.

*Removal of Exhibits.*—Exhibits received in packing-cases will be re-packed and despatched directly after the close of the exhibition. Exhibits left at the Gallery by hand must be fetched away on the day appointed, due notice of which will be sent to the exhibitors. Particular attention is requested to the removal of exhibits on the day appointed. If not taken away then, considerable expense will be incurred in removing them from the Gallery to be warehoused. This expense will be charged to the exhibitor. Exhibitors can, by giving instructions to the assistant-secretary, and paying the cost, have their pictures packed in a case and sent to destination by carrier.

*Conditions.*—It is to be distinctly understood that the sending of exhibits signifies acceptance by the exhibitor of the decision of the council, upon all matters connected with the exhibition, as absolute and final. The council do not hold themselves responsible for any damage that may happen to the exhibits whilst in their custody, but every precaution will be taken to ensure their safety and prompt return to the owners at the close of the exhibition. To avoid damage to other frames, it is requested that all frames have sunken backboards, with the fastening nails not projecting, and the back covered with thick brown paper.

*Optical Lantern.*—Photographic lantern slides will be shown by means of the Society's optical lantern during the exhibition. The loan of slides for this purpose is invited; they must not exceed $3\frac{1}{4}$ inches in height, and, to enable the committee to select and arrange them, must be delivered at the Gallery not less than one week before the evening of their being shown in the lantern.

Blank entry forms and any further information respecting the exhibition, apparatus, and lantern slides, also nomination forms for membership, can be obtained from the assistant-secretary, P. S. G. B., 50, Great Russell Street, London, W.C.

An Improved Photographic Car.—The Pennsylvania Railroad Company is now having made, on a most elaborate scale, a photographic survey of their great system. The work is being done by Mr. William H. Rau, of this city, whose wide experience in every branch of photographic work, and in almost every part of the work, especially fits him for the undertaking. The railroad company has built for Mr. Rau a "photographic car," in which he will this summer travel from point to point, as the requirements of the work dictate. The car is not only thoroughly equipped as to dark room, water supply, and all the other photographic necessities, but with sleeping and dining conveniences as well. The "survey" will be mainly in the line of the picturesque, and the appliance which Mr. Rau is enabled to bring to bear upon the work will make the results especially valuable. Mr. Rau has already begun operations on the Pittsburgh division of the main line.—*Philadelphia Public Ledger.*

## HAVE NEGATIVES ANY VALUE?

Under the above title the well-known photographer, Mr. A. Bogardus, writes the following in *The St. Louis and Canadian Photographer*.

There seems to be but one opinion on this subject from the men in the fraternity who are capable of forming an opinion; but one opinion from the man whose position enables him to decide it intelligently—they are valuable. In establishments where they are registered regularly a large income is derived from them. They are valuable as an investment, and add much to the value of a gallery. They are also valuable to the family desiring duplicates, and doubly so after the death of the party represented. At one period of my business career, the income from duplicates averaged one hundred and twenty-five dollars per month, not counting publics. I am well aware that the orders for duplicates are much larger from the recently executed negatives (if the picture is satisfactory), yet the older the collection, the more valuable it becomes. As time passes, more of the persons represented are dead, and duplicates are in demand. Of course, in a large collection there are many from which orders are never received. Yet the fact of these being in place ready to fill any demand, and liable to be in demand any hour, renders the collection more valuable. They are a good investment pecuniarily if one dozen is ordered from each hundred negatives in the course of one year.

Rip-rap operators who, after getting a man's money, give him anything that happens to come up, may well say negatives have no value. They guess it the first time. Such men never receive orders for duplicates, and never expect to. The first dozen gives the man his "fill." The creature who goes on the witness stand and swears that negatives have no value, does so to injure his successful rival, or is destitute of brains, and it would be a good investment if he should go to the nearest drug store and try to buy ten cents worth of that commodity. If he succeeds in making a purchase, the amount named will be sufficient to keep him in stock for his lifetime.

As to insurance. Have a specified value for negatives stated on your insurance policy. In my insurance the value of each registered 8 by 10 negative was fixed at one dollar over and above its value as glass. This rating continued several years, and when the register numbered upwards of sixty thousand, a conference was held with the company's agent, and fifty cents. for each negative was agreed upon over and above its value as glass. During my long career I had but one fire, and that did not reach the negative rooms, the sky-light and a small work room receiving the principal damage. The few negatives in the work room were valued and paid for as per the amount stated on policy. It is not worth while to say the negatives of publics are valuable. It is a self-evident fact. When the lamented President Garfield died, it was impossible to supply the demand. I had orders for ten where I could only print and finish one. Each day's printing was sold before they passed through the burnisher.

A properly registered and well preserved line of negatives is your stock-in-trade, and in many instances all the photographer has to show for his years of care and trouble. The knowledge that you register and preserve your negatives tends to give a stability to your establishment. Your patrons appreciate it, especially when the death of some loved one makes duplicates desirable.

It seems a waste of time to argue this matter; you might as well debate as to whether water is wet, or whether fire will burn your fingers, as to discuss such a self-evident fact.

Carefully number each sitting, place a corresponding number on the negative, enter the names on an index book alphabetically for reference, and at the end of five years judge whether they are valuable. They are doubly so at the end of ten years.

## Patent Intelligence.

### Applications for Letters Patent.

13,138. Thomas Furnell, 72, Lordship Lane, London, "An Improved Instantaneous and Time Shutter, called a Slot Shutter, to Work in the Diaphragm Slot of Photographic Lenses."—*August 4th.*

13,229. Edward Hippolyte Derepas, and Alexandre Ernest Derepas, 46, Lincoln's Inn Fields, London, "Improvements in Apparatus for Binding or Securing together Sheets of Paper, Photographs, Pattern Cards, and other Articles."—*August 4th.*

13,423. Jules Decoudun, 6, Lord Street, Liverpool, "Improvements in or Connected with Lanterns, more especially for Photographers' Use."—*August 8th.*

13,448. George Frederick Fraas, 18, Portland Street, Commercial Road, London, "A Hand or Detective Photographic Camera."—*August 8th.*

13,449. Louis Gandolfi, 186, Fleet Street, London, "Improvements in Mounting the Front of a Photographic Camera on its Vase."—*August 8th.*

### Specifications Published.

3,571. *March 6th*, 1890.—"Shutter for Flash-Lamps." R. Slingsby, 168, High Street, Lincoln.

An arrangement is provided by which the camera shutter is actuated simultaneously with the flash-lamp or lamps, so that the shutter will be open for any interval during the flash, or the shutter may be actuated immediately before the flash.

3,718. *March 8th*, 1890.—"Studio." R. W. Thomas, 121, Cheapside, London.

The studio may or may not be portable. The sides are made preferably of canvas mounted on metal frames, and can be set at the best angles for reflecting light on the sitter.

3,730. *March 8th*, 1890.—"Film Apparatus." M. Evans, Savile Club, Piccadilly, London.

This relates to improvements on the invention described in Specification No. 10,131, 1889, consisting of means for intermittently actuating the film of the roller slide, and, at the same time, controlling the movements of the instantaneous shutter. The camera is intended to produce a rapid succession of pictures of moving objects to be afterwards combined by zoetropic apparatus. In one form of the roller slide, the film is drawn off the store reel, over a guide pulley, between two rollers (one of which is turned by a handle), and finally on to another store reel. To give the intermittent stoppages to the film necessary for exposure, a pin on the driving roller presses a brake block for a moment against the strip, and, at the same time, pushes the roller out of contact with the driving roller. To keep the film stretched, one of the store reels is driven by frictional contact through one of the gear wheels. Other modifications are described, in which the stoppage of the film is produced by withdrawing the actuating force without applying any special brake.

3,736. *March 10th*, 1890.—"Stands for Enlarging or Copying Photographs." J. C. Shenstone, 13, High Street, Colchester.

A board to receive the image slides on a graduated bar which slides in a platform adapted to support the lamp and camera. The platform is provided with a supplementary platform for the camera.

3,743. *March 10th*, 1890.—"Cameras and Dark Slides." W. Scorer, North Street, Havant, Hants.

A reversing frame at the back of the camera is provided with a sliding catch, which, when the dark slide is pushed into place, is slid under a catch on the latter, which is thus secured to the reversing frame. At the same time the catch is withdrawn from a notch in the dark slide shutter, which can thus be withdrawn only when the dark slide is secured to the camera. The camera back is provided with stops along one side and the bottom to ensure a light-tight joint with the dark slide. Also a shutter hinged to the reversing frame springs out at right-angles to the frame wheu the slide is withdrawn, and thus serves to exclude light. The two parts of the dark slide are fastened by a screw, which takes iuto sockets in both. The screw is fitted with a collar, which preveuts the screw being completely withdrawn. The base of the camera is provided with a slide which moves betweeu hooks, which arrangement is an improvement on the invention described in Specification No. 12,573, A.D. 1888. The Provisional Specificatiou also describes a modification of baseboard adapted for taking panoramic views.

*Stands.*—The legs consist of narrow strips of wood, which are jointed to parts to which the tip is adjustably secured by a thumbscrew. There are also supports for jointed stretchers, which take into notches iu the narrow strips of wood. The top ends of the latter are adapted for engaging with the base of the camera or portable dark tent, &c.

## Correspondence.

### "NOTES ON PERSPECTIVE DRAWING AND VISION."

Sir,—I notice that Dr. Emerson and Mr. Goodall have seut some observations on an article of mine to several photographic publications. I shall be glad if you will allow me to state that, as I have not a copying clerk at hand, I have sent what I have to say on the matter only to the journal in which my article appeared. Chapman Jones.

### THE "HOROPTER."

Sir,—In your issue of the 31st ult., I am not satisfied with the report as conveying exactly all I had to say. I gave a description of the "Horopter," gathered from authorities such as Helmholtz, Le Conte, and others, and referred those present to the works themselves, rather than occupy space by a suggestion that what I had said ou this matter need not be fully reported. I showed that no photographic method could reproduce the "Horopter." I considered Emerson and Goodall's paper a very important contribution, but was uncertaiu as to the full bearing of all the experiments on photographic perspective.

Briefly, the drawiug by a rectilinear lens and monocular perspective are absolutely identical when taken from the same point of sight and viewed from the same point. What I learnt from Emerson and Goodall to observe and express was, that neither monocular perspective nor its true parallel, the drawing of a photographic lens, really convey the sensuous impressious of vision, and that they become more and more unsatisfactory and unlike the sensuous impressions the wider the angle included, particularly with a lens of short focus, when not viewed at the distance of the focal length of the lens.

I found it was not a subject to be discussed and dismissed in a few words that had refereuce to measurement. That part has been self-evident from the first; but the bearing of work and observations such as that recently brought forward by Emerson and Goodall are uot those of measurement, but of individual impressions to be arrived at by individuals, in the maiu similar, though incapable of measurement. They have expressed for us what we have felt, and "balanced the egg" in this subject.

New laws are not given, as they cannot yet be reduced to measurement, if they ever will be. Photographic drawing and monocular perspective are, and always have been, capable of reduction to measurement, and in this difference lays the contention these gentlemen support, that photographic drawing is unsatisfactory and "small" in its rendering of sensuous impressions. Thos. R. Dallmeyer.

P.S.—I have read Mr. Burton's contributiou in the same issue of your paper, and will send you a few comments thereon on my return to town.

25, *Newman Street, W., August 12th.*

### EXHIBITION AT THE CAMERA CLUB.

Sir,—Will you kindly allow me to draw the attention of those interested to the exhibition which is now proceeding at the Camera Club. In addition to the photographs by the Countess Loredaua and the Marquis Dr. Vianna, we now have a collection of photographs by Prince Chotek, Prince Ruffo, and Herr Dreeseu, all of which are of such interest that every photographer should seize the opportunity of seeing them together.

The exhibitiou is open ou the usual conditions, namely, admission from 10 a.m. to 4 p.m. by tickets from members or from the hon. sec. G. Davison, *Hon. Sec.*

*Charing Cross Road, W.C., Aug. 10th.*

### GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

Sir,—The announcement that we have extended the time for entry till August 20th has brought me a number of enquiries as to the latest date for sending in pictures. I regret that we cannot make any chauge, and the last day must be August 22nd, as per prospectus.

William Goodwin, *Hon. Secretary.*

*Glasgow, Aug. 10th.*

### THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Sir,—In justice to Mr. H. P. Robinson and to the Photographic Convention, I think it ought to be explained that Mr. Robinson, though he felt compelled to decline the presidency of the Convention at Edinburgh next year, did so on the sole ground that he feels physically incapable of undergoing the necessary exertion. It was certainly from no disinclinatiou to accept the invitation of the council that Mr. Robinson decliued the office. William Bedford, *President.*

*August 8th.*

### REDUCTION OF RAILWAY FARES FOR PHOTOGRAPHERS.

Sir,—With reference to the memorial initiated by my Society with a view to obtaining a reduction of fares for photographers and photographic societies, I regret to inform you that, at a meeting of superintendents held at the Railway Clearing House ou the 29th May last, it was resolved that the application could not be granted.

H. Selby, *Hon. Sec., West London Photo. Soc.*

42, *Ladbroke Grove Road, London, W., August 6th.*

### THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

Sir,—A communication signed by "A Member of the Camera Club," in your issue of July 24th, reflecting somewhat on our New York Exhibition management, calls for an explanation. The reader would be led to infer that out of thirteen photographs sold, the value of which was £3 10s., only 7s. was returned after expenses were deducted. In reality, but seveu of the thirteen photographs were sold, amounting to £2, from which 4s. were deducted for commissions, 8s. duty, and 17s. for expressage and Custom House brokerage, leaving a nett result for the exhibitor of 11s., and six photographs (returned) valued at 30s., or an equivalent of £2 1s.

My communication in your same issue further explains the delay we experience in getting photographs through the Custom House.

Had the exhibitor notified the committee by mail of the date and the express company by which the pictures were shipped, probably they could have been gotten through the Custom House earlier, as was the case with Mr. Sawyer's exhibits.

That the exhibits were unusually delayed is certainly not the fault of the committee, but of the carrier, and upon the latter should rest the blame. F. C. Beach.

*Chairman, Committee of Arrangements.*

*New York, August 3rd.*

## Proceedings of Societies.

North Middlesex Photographic Society.

*August 10th.*—Mr. H. Staveley in the chair. Formal business having been taken and a new member nominated, objects of interest were called for.

Mr. Gill showed some hand-shutters and an exceedingly cheap half-plate camera made by Mr. Farrow, of Hornsey Road.

Messrs. Adams & Co. sent one of their "lightning" tripods, a Gilmes lens adapter, a "holiday" lamp, and a metal developing dish with cover, all of which were thoroughly examined and approved of.

Mr. Stewart reported that he had tested Mr. Barry's printing meter, and believed that, carefully worked, it would prove useful in carbon and opal printing.

Mr. Taylor then gave his demonstration on "Development," and explained the action of the various constituents of the developer—tho reducing agent, the restrainer, the accelerator, and the preservative; and, having brought six plates—two fairly-exposed, two under-exposed, and two over-exposed—proceeded to treat one of each with a normal developer, and then to develop the remaining under and over-exposed plates with such modifications of the developer as to make the best of them.

The usual competition of prints taken at field-day took place, Mr. Ainsley receiving the vote of merit for Kingsbury, and Mr. Walker for Beddington.

Sydenham Amateur Camera Club.

The usual fortnightly meeting took place on August 4th at the "Greyhound," the President in the chair.

In place of a discussion, Mr. Zimmer gave a demonstratiou of alpha printing and toning.

On Saturday, 8th inst., Mr. Piggott conducted an outing from Reigate to Betchworth, where the members had the opportunity of photographing wind aud water mills, sheep-folds, cornfields, &c., from which several satisfactory pictures have resulted.

Photographic Club.—Subject for Aug. 19th, "The Diazotype (Primuliue) Process"; 26th, "Films." Outing, Aug. 15th, West Drayton; train from Paddingtou at 2.35.

Richmond Camera Club.—At the meeting on the 7th inst. (Mr. Carolin presiding), Mr. Cembrano's report as delegate to the Photographic Couvention was unavoidably postponed till next Friday, and the subject "Home Portraiture" was discussed.

Diazotype Company. — Our attention has been called by this Company to an omission which lately occurred in our description of their process, which is based on the joint invention of Messrs. A. G. Greeu, C. F. Cross, and E. J. Bevau, and not on that of the first-named gentleman alone.

Automatic Photography. — The case of the Automatic Photograph (Foreigu and Colonial) Compauy came before Mr. Justice Chitty on Saturday. This was a petition by the Company for its winding up. It was formed for the purpose of supplying photographs, which Mr Whitehorn said people were supposed to get by dropping a penny in a slot and standiug in front of a lens. A petition had been presented to wind up a company for supplyiug England with the machines, but it was to stand over. With regard to the present Company, it was asked that it might be similarly dealt with, as a meeting of shareholders had appointed a committee to iuvestigate its affairs, aud it was desired that the petition should not be heard till the report was made. The postponement was opposed by Mr. Byrne, Q.C., on behalf of some of the shareholders. He submitted that the Company could not carry on business at a profit, and to let the matter stand over would be merely to waste the shareholders' money. Mr. Justice Chitty made a compulsory winding-up order.

## Answers to Correspondents.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

E. B. B.—*Reversed Portrait.* Except from the title of the newspaper reading backwards, it would be impossible for a stranger to tell that the portrait *was* actually reversed; but you, having taken the picture, know that the old mau's left cheek and ear were illumiuated, aud the right side cast iu shadow, at the time of the sitting. Now, your letter of advice says: "The plate was put in the right way, or the print would not appear so sharp." So you believe; but, with all due deference, we beg to doubt this. The plate must have been put into the carrier for once with its sensitive side up, and the picture taken through the glass would give exactly such a result, as is well-knowu to all workers of the photo-mechanical processes. The difference in the length of focus might not be enough to interfere with sharp definition, especially with the splendid lens which you fortunately happen to possess.

W. T. W.—1. The letter announcing your change of address came to hand just in time to enable us to convey the information to our correspondent. 2. Leave the other matter in our hands uutil we find an opportunity of consulting with the person named, who is at present out of town. A cheap process is a desideratum.

H. G. (Brockley).—*Silver in Spent Developers.* The quantity is so small that it would hardly be worth while attempting to treat these separately; they should be put into the waste hypo residues, and then worked all together for silver.

M. P. (Redhill).—*Preservation of Sensitised Papers.* Twelve mouths is a loug time to keep any kind of ready-sensitised paper, and we doubt the policy of eadeavouring to push the conditions of permanence to this extraordinary leugth. Citric acid in the nitrate bath is the best kuown means of preserving the silvered surface, several formulæ for which you will find, as in chapter xxi. of Mr. Heighway's "Photographic Printers' Assistant"; Captain Abney's "Iustruction in Photography," page 268; aud others at the end of the Year-Book, pp. 232 and 233. *Blisters in Albumenised Prints.* Besides those you have enumerated, a fertile cause of this defect is the over-dryness of the paper at the time of albumenising; or bubbles happeuiug at this stage aud not quickly enough dispersed, which would lead to imperfect adhesion, ultimately resulting in blisters when the prints are being toued and fixed.

Blocks.—*Instruction.* Mr. W. T. Wilkinson, of 17, Henry Street, Derby, undertakes to give practical lesssons in photo-mechanical work generally, aud we have no doubt but that he would be able to instruct you iu the details of the process mentioned.

Constant Reader.—*Selection.* Most amateurs would prefer to use 3 or 4, aud pay the difference of cost for a superior article; but if money is an object, make do with No. 2, or even No. 1. Outside these we have no suggestion to offer.

G. Y. (Gourock).—*Platinum Compounds.* The salt uamed, besides all the other compounds of platiuum, can be procured from Messrs. Hopkin and Williams, 16, Cross Street, Hatton Garden; or, failing theui, from Messrs. Johnson and Matthey, Hatton Gardeu, who only supply in larger quantities.

Confused.—*Apparatus.* The camera mentioned is oue of the best made and most reliable in the market, and, together with the *first* of the lenses named, would constitute a thoroughly satisfactory outfit.

C. B.—*The Copyright Question.* We have read Mrs. Earnshaw's letter of August 5th, whereiu she distinguishes between "colour copyright" aud "copyright iu mouochrome." Until theu we always supposed that possession of the picture covered all kinds of copyright, but it appears that, in this case, the lady artist specially reserved the right of reproduction in monochrome, being already in treaty, as she believed, with the proprietors of the *Queen* newspaper for its appearance as one of their ordinary illustrations. For full text of the letter see the *Daily News* of 6th instant.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1720.—*August* 21, 1891.




CONTENTS.



## PHOTOGRAPHY IN STARLAND.

As might be expected, Dr. Huggins, in his presidential address to the British Association assembled at Cardiff, devoted a great deal of attention to the important work which has been done, and which is yet in progress, in which the photographic plate is being employed for the portraiture of the heavens. He called to mind the noteworthy circumstance that, at the very beginning of the history of photography, on the occasion of the announcement of the discovery of Niepce and Daguerre to the French Academy by Arago, that savant held out the hope that the wondrous new method of picture-making would be applicable to a more perfect delineation of the sun and of the moon than had before been dreamt of, and we all know that the prophecy came true, for such pictures were among the first which were successfully accomplished by the new art. These pictures, in fact, are still pleasant to look upon, so well are they executed, in spite of the many disadvantages under which they were produced, and with which photographic processes at that time were necessarily associated.

Even after the wet collodion method came into vogue, the difficulties of photography, although lessened, had not by any means been removed, and astronomical photography—except so far as it related to picturing the orbs of day and night—was still unheard of. And this, as the president of the British Association was careful to point out, was not for lack of instruments, but simply because of the shortcomings of the chemical process employed. The young photographer of to-day, why buys his plates ready prepared for his camera, has little notion of the anxiety and trouble which practice of the art involved under the old order of things. It would be beneficial to him in other ways, as it certainly would be as an item of photographic education, were he to learn in a practical manner how to clean a glass plate, how to collodionise it, and how to prepare a silver bath in which to sensitise it. He would soon see that the workers of old had many difficulties to cope with of which before he was ignorant, and possibly he would, after this experience, be the more ready to acknowledge the debt which he owes to the pioneer workers, and to the makers of commercial dry plates. If a candid man, he might even go so far as to acknowledge that, if photography were still to involve all the worry and mess that it was once credited with, he would never have bothered himself with a camera and its belongings.

The modern astronomer is in much the same position as the hypothetical being whose position we have just reviewed. He, too, can say that if photography still involved the use of a wet plate he would have none of it, not for the reason of its troublesomeness, but simply because it was not adapted to his work. For the sun and moon the old process was, as we have seen, good enough, for the flood of light given forth by the former was sufficient to impress a plate with its image in a very small fraction of a second, while the reflected light of the latter afforded sufficient radiance to perform the work in less than a minute; but when the more remote bodies in space came to be considered, it was found that their light was insufficient to impress the plate while the latter remained in a sensitive state. The collodion surface broke down, or rather, it became insensitive as the moisture evaporated from it, and therefore it required to be used fresh from the bath, or not at all. It is true that, by certain treatment with honey, &c., the evaporation could be delayed for a long time, but still not long enough to suit the purpose of the astronomer.

Then came the sudden revelation that, in the gelatine dry plate, we had a new agent which could do things which never had been accomplished before; a plate which was so sensitive to feeble rays of light that the utmost precautions had to be taken in all the necessary manipulations. The old brilliant yellow light, in which the photographer was wont to work, had to be discarded in favour of a deep red, which seemed just enough to make darkness visible. But beyond their wondrous sensitiveness, the new plates had other merits of an equally noteworthy kind. The chief of these was that they preserved their properties for an almost indefinite time, and development of the image could be put off for days, weeks, or months, to suit the convenience of the operator. Photography had, by the introduction of these dry plates, suddenly found itself in a state of revolution, and the new took the place of the old with astonishing rapidity.

But while the general public were busying themselves with the wonderful pictures obtainable by aid of the gelatine plate, the astronomer was not slow to see that this plate was the very thing that he had been waiting for so long. It answered all his requirements in responding to very feeble gleams of light, in remaining sensitive for any time required during exposure, and keeping well after exposure and before development; for the pictures which he dreamed of taking, wheth er they were of planets, distant stars, or nebulæ would require an exposure reckoned by hours rather than by seconds. The new agent was found to be fully equal to the call made upon it, and for the first time star charts were printed by their own feeble light.

But the dry plate is something more than a mere registrar of stars; it is, in a manner, a discoverer as well. Who does not remember the story of the discovery of the nebula attached to Maia, one of the stars in the Pleiades, and how it was found first of all in a photograph, its existence not having before been suspected? Then we have the totally unlooked-for result that the dry plate registers stars so distant that they have never yet been seen by human eye, even when aided by the most powerful telescope; for the action of the plate is cumulative, and these distant bodies, giving forth a light too feeble to excite the retina of the eye, by mere persistence of shining impress the sensitive plate.

But while taking credit to photography for so much, should we not say a word for the wonderful precision of the instruments employed? Who among us has not, in an idle moment, looked at Jupiter through the telescope of some itinerant astronomer, and has seen how the bright globe of light and its attendant satellites are plainly delineated on the dark blue of the sky? But, as we gaze, they are fast travelling out of the field of the telescope, and its owner has to give the instrument a jerk to one side in order that the image of the distant planet may once more run its course over the limited space. This motion, as we all know, is not due to Jupiter and his moons, but is an illusion caused by the movement of the earth itself. In our observatories this movement is counteracted by a clock, which controls the telescope and keeps the objects in the same places in the field of view. How beautifully made and delicate this apparatus must be when it is found possible to keep the image in exactly the same place on a sensitive plate for several hours. Nay, it is possible to do more than this. The same plate can be exposed for several evenings in succession, the work broken off by clouds or other obstructions on one night being taken up on succeeding nights. This power of executing the portraiture of the stars by instalments is one of the many benefits brought to astronomical research by the modern photographic dry plate.

## PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

French Photographic Society—Meeting of August 7, 1891—Retouching Negatives from the Back—Apparatus for the Measurement of the Field of Vision and of the Focal Length of the Lens—Apparatus for Preparing Concentrated Solutions—Trial of Sensitive Plates—Celluloid Dishes—The "Mignon" Instantaneous Shutter—Oil for Lubricating Shutters—Self-Stretched Films with a Metallic Border—Oxy-hydrogen Lamp—The Ether Light—Photography in Colours.

At the French Photographic Society's meeting on August 7th the atteudance was but meagre, for the excursion season is at its height, and many members are at this time of year sojourning in the country. The process of retouching suggested by M. Poex seems difficult to realise in its normal couditions. He proposes to print a preliminary proof on paper, and to attach this by gum to the glass side of the negative. It would take too long to fully discuss this method, the weak points of which are immediately apparent.

The method brought forward by M. Sébert is based upon a plan which has already been indicated by Monckhoven. Its object is to measure the field of vision and the focal leugths of lenses. Two lines are traced ou the focussing screen of the camera at a certain distance from one another, aud the same distant point is alternately focussed. The same gentlemau brought forward a method by which concentrated solutions can be conveniently prepared.

Several manufacturers of dry plates were invited to send in specimen packages of their plates. M. Gravier stated that these plates had been submitted to trial in the presence of a few members of the Society. A small strip was cut from each of the different brands of plates, and these were placed side by side beneath a graduated screen, such as that employed in Warnerke's sensitometer. The whole were then exposed to the light of a taper for a determined time, and afterwards developed. The scale of tints thus obtained readily showed the relative sensitiveness of the plates. From the firm of Block, some celluloid dishes for developing purposes, as transparent as those of glass, were brought forward by M. Gravier.*

A new instantaneous shutter called the "Mignon" has been introduced, which has the merits of being cheap, easily manipulated, and capable of being used for instantaneous or time exposures. This shutter is small and compact, and is made entirely of metal. It is always set ready for action, and its mechanism is of such a character that it cannot readily get out of order.

The firm of Dehors and Deslandres present some printing frames in hardened cardboard. They are light, and not so easily broken as those made of wood. The same firm also bring forward au oil made specially for lubricating shutters and other apparatus having moving parts.

An automatically stretched film is brought forward by M. Planchon. In this case the emulsion is run upon a thin metallic frame which serves to keep the film, when dry, perfectly flat, and this permits it to be placed in the dark slide without any additional support. After development the frame is cut away and discarded, its work having been done. It remains to be seen whether this method will have any practical value.

* These dishes are sold in London by Mr. Gotz, of Buckingham Street.

The oxy-hydrogen lamp presented by M. Pellier has not given the expected light, no doubt because the pressure on his gas cylinders is insufficient.

As will be seen, the meeting did not result in anything very important being brought forward. We must, however, say a few words about M. de Saint-Florent's communication relative to photography in colours. He showed various proofs printed on celloidin paper. The images show analogous colours to those of Mr. Veress, of Klaussenbourg. M. de Saint-Florent thinks that the colourations are formed in the same manner as those produced by M. Lippmann, and he looks to this direction for a solution of the problem of photography in colours. The author of this communication has found means to fix these multi-coloured images, and the method by which he works will presently be published.

## DEVELOPING.

BY E. DECKER.

"There is a great deal of difference between seeing and observing." There is a mountain of truth in a molehill of words in that quotation, which will apply to developing as well as many other things.

It is merely putting in "brains Q. S." with the other constituents of the developer, but that makes all the difference (except that through pure luck) between a negative that will make a photograph that is a joy to look at, and a piece of paper with a blotch of silver over it. New developers and new developing agents can be obtained from nearly every one of our photographic journals. They are probably all good, only some may be better than others. It is not so much the formula, but the way it is used, that gives the result. There are probably no two persons, using the same plates and developer, that will produce the same quality of negative. One will only see that the image makes its appearance in due course of time, will see that it continues to develop, and when he sees that it is sufficiently dense will remove it from the developer. Another will not only see when the image appears, but will observe whether it is too slow or too quick, and will add a little force or apply the brakes as it may need. He will observe the exact time when it should be removed from the developer, and whether it should be washed very quickly before applying the fixing, or whether a longer washing would be better.

Whether pyrogallic acid, eikonogen, hydrochinon, iron, or any of the very latest developers should be used, should depend upon the observation of each one using them. Each one may be better for some special purposes than any or all the others. For general use, however, each person should adopt some special developing agent, learn to use it, and stick to it. Have also a standard developer; but, as there are many exceptions to most rules, so remember that you must look out for these exceptions in the way of different plates, different exposures, and different subjects, and strengthen or weaken your developing agent or your alkali, or add a retarder.

Among all the old or new developing agents "pyro" still holds the lead, and, from all appearances, will continue to do so. So far as my own observation goes it gives better strength, better detail, better printing qualities, and, for an over-timed or under-timed plate, a better negative than any of the others. It may not make so handsome a negative as some of the others, but it is not the beauty of the negative itself that is wanted, but the beauty of the print to be made from the negative. It is true it may stain the hands, but that can be remedied by using a pair of rubber gloves. The staining of the negative itself, where it goes so far as to be a detriment to its printing qualities, can be easily remedied; but in most cases, particularly where it only leaves a slight olive colour, it is much preferable to what is called "a wet plate effect."

You can make with "pyro" a negative as "thick as a board," or one as delicate as the bloom on a young lady's cheek, with the same kind of plate and the same exposure.

With the quickest plate a line drawing can be copied that will leave the lines pure black and the whites white paper, or all the detail in lights and deepest shadows in the portrait of the fairest blonde dressed in her bridal robes. To develop a first-class negative presupposes a correct, or nearly correct, exposure of the plate. Perfectly correct exposures are, and must be, extremely rare. It would take a long mathematical calculation and very sensitive instruments to give the exact strength of light with its shade of colour, and more exact shutters to our lens than we now have, with an operator at the shutter capable of taking advantage of all the mathematical and scientific points, to "touch the button" at the exact instant of time to get that exact exposure.

Such being the case, a "standard developer," while being "handy to have in the house," can be very seldom used without some change if the very best effects are truly sought for.

Have your sulphite of soda and your alkali of a standard strength; add the pyro only when you are about to use the developer; make a little stronger solution of pyro for emergencies, and have your bromide ready for use; then use all with discretion, not only seeing, but observing.

Have you ever thought how much developing a plate is like creation? Do you ever think that you are creating a little world every plate you develop? The developer is poured over the plate, and soon the tops of the highest mountains appear in the shape of the highest lights, then the lower hills as the lighter shadows, then the rolling and flat earth as it graduates into the deep shadows represented by the seas. Usually we so develop our plates that we can say, when finished, "Behold, it is good!"—*Buffalo Convention.*

Hints about Varnishes.—In making varnishes of all kinds, care should be taken in every case to see that the spirit is of full strength, the resins free from moisture and all foreign matter; and where the finer sorts of varnishes are to be made to see also that the resins are all fine picked. The resins should be small, and, if possible, granulated, as, if they are in large pieces, their solution is protracted, while, on the contrary, if they are too small and powdery they get into a cohesive mass, in which state it is almost impossible to effect solution. To effect speedy solution of the resins various plans are resorted to, such as constant agitation, with occasional immersion in hot water—if the varnish is being made in small quantity—in a glass bottle, or by rolling jars or tins on muffled rollers where the varnish is being made in quantities of two or three gallons, or in casks turned by mechanical means where the varnish is required in quantities larger still. It may be convenient, in the case of turpentine varnishes, which do not evaporate so quickly, to make them in wide-mouthed jars, and simply stir them frequently with a stick. If the stirrer in this case is provided with cross bars, the mass is more effectively broken up, and a solution consequently hastened. It is almost unnecessary to add that the utmost care and cleanliness should be exercised in the making of varnishes, as the least dust or moisture will affect their quality.—*Paint, Oil, and Drug Review.*

## THE ZOOLOGIST'S DEBT TO PHOTOGRAPHY.

BY G. A. B.

Photography has so often been styled the "handmaid of science" that the remark, although most true, has become, like the proverb quoted by Hamlet, "somewhat musty." But there is one branch of science which, I think, owes a debt to photography which has remained, as yet, almost unacknowledged. I allude to the great help which the art of sun painting has brought to the zoologist, in giving him far more perfect pictures of animal life than he could possibly command before its advent. Many of the representations of animal life with which our forefathers were obliged to content themselves were perfectly ludicrous in character, and were as unlike the animals that they were intended for as it was possible for them to be.

The earliest representations of animals are those found inscribed on bones and pieces of slate and stone which have been found in certain caves in France. These are supposed to be pre-historic, and owe their origin to the work of those early hunters who found their homes in these caves. One well-known one is supposed to be the only authentic portrait, if it can be called so, of the mammoth, or extinct elephant, and it has been executed with a sharpened stone on a piece of mammoth ivory. Another drawing of the same period gives a very fair representation of a battle between stags, in which the antlers are intermingled in a singularly truthful manner. But perhaps the best of these early drawings is one scratched on bone representing an animal with the lower jaw slightly displaced, so as to indicate the act of chewing the cud.

Now, strange as it may seem, these very early attempts at art are really more satisfactory as pictures, and more correct in their drawing, than numbers of works which have been used for illustrating books at, of course, a far later period. For some years it has been a hobby with the writer to collect books of a bygone age, especially those containing cuts of an extraordinary character, and interspersed among these are several books of travel containing representations of natural objects of a very marvellous kind. Travellers' tales used to be looked upon with grave suspicion, for men were not able to believe in anything outside their own environment; but if the tales were no truer than the pictures which illustrated them, the readers were certainly justified in hesitating to swallow them without a little mature consideration.

One of these books I recently took down from its shelf, and I have copied, for reproduction by the zincographic process, a few of the curious cuts which adorn its pages. These cuts were executed long before the revival of wood-engraving in this country, under the fostering care of Bewick, and the plate-mark, which is still visible round the margins of the original pictures, at once discloses the manner in which they were produced. They are copper-plate engravings, like all illustrations of the period, and had to be printed by a separate operation from the printing of the text which they illustrate, at great expenditure of time and labour.

The volume is still in its original leather covers, and bears date 1634. Whether the work is rare I have not had the opportunity of finding out; perhaps some reader of the Photographic News may be able to give some information on this point.

The title-page is a far more voluminous document than would be tolerated in these go-a-head days, and, as a curiosity, is worth quotation at length: "A relation of some yeares' travaile begunne *Anno* 1626 into *Afrique* and the greater *Asia*, especially the Territories of the *Persian* Monarchie: and some parts of the Oriental *Indies*, and Iles adiacent. Of their Religion, Language, Habit, Discent, Ceremonies, and other matters concerning them. Together with the proceedings and death of the three late Ambassadors: Sir D.C., Sir R.S., and the *Persian* NOGDI-BEG: As also the two great monarchs, the King of Persia and the Great Mogol. By T. H. Esquier. London. Printed by William Stansby, and Jacob Bloome, 1634."

The book begins with an account of the Canary Islands, illustrated with some pictures which are certainly like nothing in nature. Then we have an account of a tornado which overtook the ship in which the narrator of the story was journeying, which leads us to the first picture which I have selected for reproduction. But let me quote the original:—

"Yet in my judgment this (the tornado) is most unhappy to the sailors, who in those raines handing in their sailes and standing on the deckes, after the action, commonly goe to sleepe (the weather being terrible hot) in their wet clothes, which stinke very much of that ill-digested showre, and thereby beget long diseases and mortall, as the Calenture, Scorbute or Scurvie, Feavers, Fluxes, Aches, and the like: which (did they but forbeare *Arack* or strong liquours, and shift themselves out of those nasty infectious wet clothes, when they take their rest) might be prevented."

"And besides these, they should be wary, where, and when they wash themselves. Many heretofore have been devoured by ravenous fishes, such as justly we call sharkes, whose cruel appetite encourage them to devoure men alive, they are always directed by a little speckled fish, called a pilot fish, by guiding their monster-masters to a prey. Such attendants Lions have, like little Dogges called Jackalls, and here the adventurous ship-boyes were in peril of those sharkes, swimming so without heed, that some were in apparant danger. The shape of which fish


I have here (though unskilfully) pourtrayed for your better satisfaction."

Let us hope that the reader of two and a-half centuries ago received this portrayal with the wished-for satisfaction. It was certainly out of his power to check the correctness of the drawing by any standard work on natural history, for, even had there been such a book of reference at hand, its illustrations, if any, would have probably been as faulty as the one in question. People are better educated in these things now, and they know well enough that a shark does not possess a head like a rat, and that its mouth is quite on the underside of that head. The distinctive tail of the shark tribe, in which the upper lobe is double the length of the lower, is altogether missed by the artist, who has given his creation a tail like that of a herring. Very probably he had never seen a shark at all, and had made up the drawing from description, and by the help of any inhabitant of the deep which happened to be procurable. It is impossible to know what is intended by the spiral arrangement descending from the clouds, but perhaps it is a waterspout thrown in to add to the horrors of the situation.

Now, it is quite clear that the faulty nature of this and most of the other drawings is due to the fact that the artist had to work from mere description. This is evident from the circumstance that on the next page to that bearing the "sharke fish" there is a well-executed drawing of an inhabitant of Angola. This gentleman is "black but comely," his unclothed muscles are well developed and correctly drawn; the only objection to the work being that neither face nor figure has any marked characteristic about it, unless it be that of an inhabitant of England. The presumption is that the figure was drawn from a white model; but, apart from the fault named, there is nothing to take exception to.

The drawing of another biped—an inhabitant of Madagascar—cannot be spoken of in the same category, for it is as incorrect as it possibly can be. Luckily, however, the artist or author has been good enough, as in the former case, to give it a name. It is a flamingo, and about it we read that:—

"Here are many rare sorts of Birds; many we saw sold, one only I have drawne, which, though unworthy the labour, yet in that with us they are not, and the colour of their feathers so excellent crimson and white, with other colours, that they may compare with birds of Paradise."

The flamingo, as most of my readers will know, belongs to the important order of *Anseres*, or the goose tribe of birds, and the artist may have had this in his mind when he made the creature so much more like a goose than a flamingo. The head is not unlike that of a flamingo, but the neck has only a third of the length which it ought to have, and it is twice as thick as it should be. The attachment of the graceful neck to the body should not be marked by the protuberance shown, which the artist probably means for the crop of the creature. The bird is not humpbacked as shown, and its legs in the drawing are, like its neck, deprived of two-thirds of their length. An artist, whose chief work at the time consisted of drawings on wood blocks—which blocks he had to pay for himself—told me that it was always economical to draw giraffes, ostriches, and other creatures with long necks and legs in a stooping position. He generally made them in the act of drinking, so that just one-half the quantity of wood was occupied that would be required if they were standing bolt upright. The gentleman who drew this flamingo may have been guided by considerations of space in the same manner. Perhaps he had to pay for the copper-plate upon which it was engraved.

It is only fair that we should find as many excuses for the unfortunate artist as we possibly can. The author of the book probably made a rough and faulty sketch of the original creature—possibly the dead body of one—and from this the artist would be directed to make a presentable picture. He had no friendly Zoo to fly to as we have to-day, and was obliged to fill in details from his imagination.

The next example of inventive zoology which I have selected is even less veracious in character than the last. It is a picture of the penguin, and again I quote with it the original description of the bird:—

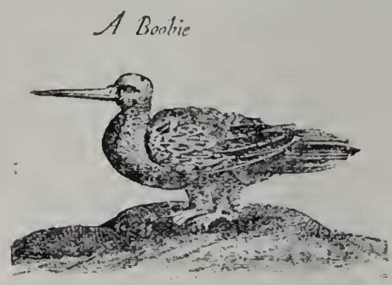
"Nearer the road (is another small Ile), seven leagues at most distant from the Bay; 'tis now and hath time out of mind beene called *Penguin* Ile, so called from a number of birds, white-headed and blacke intermixt, which bird is rather participant with the water than land, yet uses both; her diet is at sea, where she feeds and dives rarely; her nest ashore, where she breeds and rests; they have wings, but flie not; they are better to satisfie the curious than to feed the stomacke, except Oyle be delightful to it."


Penguins are familiar enough to the general reader to enable him to quickly appreciate the fact that the drawing which is here reproduced is most hopelessly wrong. Nature never yet produced such a bird as that figured here, which must, I should think, have been evolved half from mere hearsay, and the other half from the inner consciousness of the artist, helped, perhaps, by preconceived notions of what a bird's appendages ought to be like. The tail, it will be seen, is that of the sparrow, while the penguin, in reality, has no tail worthy of the name—a little pointed prolongation of the body rather than a complete organ. The artist has, too, entirely missed the most noticeable and interesting feature of this peculiar bird, which is that the wings are used as paddles in the water, and that this is almost their sole use. It is true that, when pressed by pursuers, the penguin will employ its wings as forelegs, and is able to run along at a good speed by their help, but they may be described generally as paddles, for this is their main use. There are many different species of penguins, but that most familiar to the public, and made familiar through the Zoological Gardens and the museums, is the king penguin. It is this bird which has furnished Mr. Stacy Marks with a model for his humorous picture now hung in the Birmingham Corporation Art Gallery, "Dominicans in Council." Here we see a group of these creatures on a sandy shore, and looking far more like a family of jolly fat friars than birds.

In my concluding example I give a representation of

"A Booby," and here again we have a most faulty drawing. There is less excuse for faults in this case, for the author admits that he had every opportunity of seeing the bird at close quarters—at least, this may be gathered from what he writes concerning it:—

"The foure and twentieth of *May*, we were under nineteene degrees and thirty-one minutes of south latitude, where one of the saylers, espying a bird fitly called a *Booby*, hee mounted to the top-mast and tooke her. The foolish quality of which bird is to sit still, not valuing danger, which bird I have here simply depicted as you see."




These examples of the sort of drawings that seventeenth century folks had to content themselves with are to me very interesting, and I hope that they may prove so to others. It is, of course, unnecessary to say that these crude productions were greatly improved upon in later years, but the best of them all cannot hold a candle to the beautiful work done within recent years by the camera. In connection with modern animal photography, I fancy that the earlier workers in this field are sometimes apt to be forgotten by the rising generation of photographers. But it will do no harm to remind them that certain pictures which have never yet been surpassed were taken long before the modern dry plate became an article of commerce. I may specially note the names of Mr. Haes, Mr. York, and Mr. Dixon. Any one of these gentlemen can point to pictures, taken under great disadvantages, from which the aspirant of to-day can get many valuable hints. There were then but few who attempted such work; now the camera bearers at the Zoological Gardens are almost as numerous as the animals of a lower grade. This phase of photography certainly has much fascination about it, and is most useful in giving truthful representations of some of the most beautiful of nature's works. That our forefathers laboured under some disadvantages in their endeavours to realise the appearance of creatures not indigenous to their own country, the examples which I have sent to the editor for reproduction will sufficiently attest.

---

A Novel Idea in Photography.— Ernest Marks, a young Plainfield photographer, who has made a name in connection with instantaneous photography, especially of racing events, has invented a method of photographing the finish of close races. In order to secure the exposure at exactly the right moment, he has his camera accurately placed beneath the wire on a pivot in such a way that, by first viewing the horses as they approach the last sixteenth of a mile, and following them up with his finder, the exposure is automatically made when the camera has reached its proper position under the wire just as the winning horse's nose passes under. Mr. Marks proposes to affix an electric arrangment by which he may secure a still more accurate exposure, there then being no chances of the shrinkage or expansion of the operating string. The camera will not lie, however heavy the bets may be on a losing horse, and there is no chance to declare a "dead heat" when a photographic negative plainly shows one horse to be a half head or more in advance of the other.—*Lithographic Art Journal.*

## PRACTICAL DIRECTIONS FOR THE RETOUCHING OF POSITIVES.

BY A. CHEVALIER.

### Retouching on Carbon Tissue.

The retouching of these proofs presents difficulties which are peculiar to the process, but, once well understood, it will permit one greatly to improve prints, although they may be originally of a very second-rate description. The resources at the disposal of the retoucher in this process are very many. A proof may be positively covered with blemishes, and to all appearance useless, but by following a methodical plan of retouching it is possible not only to save it, but to completely restore it. In the first place, you must attend to the groundwork in order to give to the picture its relative values. If the proof is afflicted with dark spots—which is frequently the case—you must scrape them until the blemishes are changed from black to white, and they can then be made to harmonise with the rest of the ground by the judicious use of the pencil or brush, but it is difficult to so adjust the work of the scraper and of the pencil as to obtain the required equalisation of tint.

If, on the contrary, the blemishes should be light rather than dark, the use of the brush is at once indicated. For this work you employ four colours, the mixture of which in certain proportions will give you the exact tone of the photograph. These colours are ivory black, carmine, emerald green, and blue. It is indispensable to add to the water employed in mixing these colours a sensible proportion of gum arabic, so as to give the necessary force to the shadows. Besides the gum must be added a very small quantity of prepared ox-gall, so as to make the colour flow well, and to counteract any grease which may be present.

### Stumping in a Background in Chalk (Pastel) on (say) Aristotype Paper.

In this case the background of the picture should be perfectly white. In order that the chalk may leave its mark on the paper without inequality, but with a regular grain, you must commence by abrading the paper by means of a fine linen sprinkled with finely-powdered pumice. Care should be taken to encroach as little as possible on the lines of the image, and also to avoid leaving any spaces uncovered by the pastel. You can then employ the stump, and obtain a background graduated, or of any other description.

The background thus made is mat, and by no means in harmony with the rest of the photograph. Moreover, it is so delicate that the slightest movement will cause it to rub off; so that it is advisable to fix it, and, at the same time, cause it to harmonise with the rest of the image. This can be brought about by using certain fixatives to be obtained commercially, and which are used for this purpose by pastel painters. These are applied by means of a spray producer, after care has been taken to protect the rest of the picture by means of parchment paper. This precaution is indispensable, for otherwise the wax dissolved in the fixative would interfere with further operations which might be required with pencil or scraper.

### Retouching on Eastman (Bromide) Paper.

This paper will take chalk or pencil. For the shadows it is best to employ a dark crayon, while the lights are treated with one which is very hard. In treating the background, the same method is advised as that recommended for carbon paper. It is probably more easy to make a background on bromide than on any other description of paper, because of the facility with which the chalk can be applied to it.

Platinum Paper.

This paper can be retouched in the same manner as the last. Some have tried to treat it with water-colours; but before this can be done satisfactorily the paper must be steeped in a solution of arrowroot—a proceeding which is applicable to neither bromide nor carbon paper.

Such are the means, stated in a condensed form, by which the methods are available for retouching on several kinds of photographic paper. The operator must not be afraid of retouching by any of these methods. At first they may appear to be difficult; but, with care and perseverance, all fancied obstacles in the work are easily surmounted, and the results obtained are worth striving for.—Abstracted from *Revue de Photographie.*

## PHOTOGRAPHIC EXHIBITION IN GLASGOW.

Glasgow, says the *North British Daily Mail*, is to have an international photographic exhibition on a scale never yet approached by any other city in the kingdom. In 1883 a small coterie of gentlemen formed themselves into the Glasgow and West of Scotland Amateur Photographic Association, and it was soon obvious that the movement was to be attended with more than ordinary success. The roll of members steadily increased year by year; a large and well ventilated suite of rooms was eventually engaged, where members could develop their plates, hold business meetings, read technical papers, and give practical demonstrations; and so popular did the movement become that ere long the executive found it necessary to extend not only their premises, but also the time of such meetings from a limited portion of the year to all the year round. Informal meetings of the members are now held almost nightly, whilst during the winter season lime-light entertainments form an attractive feature of the Association's programme. The outcome of all this has been an ever-increasing number of members to the roll, until, from about a dozen or so in 1883, the list has increased to over two hundred, amongst whom will be found the names of many of the most prominent merchants and manufacturers in the West of Scotland.

For some time there has been a strong desire on the part of several of the leading members that Glasgow should not be behind other photographic centres in the way of affording the public ample opportunities of seeing on a large scale the class of work that amateurs from all parts of the world can turn out, alongside that of well-recognised professional workers; and the thanks of the public are due to the indefatigable exertions of Mr. John Morison, junr., the president of the Association, and the enterprising council who are at present directing the Association, for their endeavours to organise in Glasgow an exhibition which will exceed in importance any such exhibition hitherto held. A large guarantee fund has been subscribed, chiefly among the two hundred members of the Association, and the executive have wisely called to their aid the services of several of the most experienced professional workers in the district, the result being that the movement has assumed dimensions of no ordinary character, and will embrace several novelties not previously seen at similar undertakings.

The entire suite of rooms forming the Fine Art Institute has been engaged for the whole of the month of September, and the exhibition of work will not only be of a truly international character, but will embrace some special features in the way of photo-mechanical exhibits. Among other numerous interesting exhibits will be found a series of photographs taken by Surgeon Newlands during the recent Manipur expedition.

Arrangements have also been concluded with well-known lecturers, who will give nightly lime-light entertainments in the large hall; and, to ensure the success of this branch of the Exhibition, a special twenty-feet opaque screen has been erected at the west end of the room for the projection of photographic transparencies. The list of lectures, both amateur and professional, will be found to contain the names of Mr. Andrew Pringle (with his "Life and Songs of Robert Burns"), Mr. Thos. N. Armstrong (with an entirely new lecture-set of a "Caravan Tour through the Trossachs"), Mr. Ralph Elder (with the outcome of this year's holidays, spent on the Continent), Mr. Paul Lange (with his popular "Tour in Iceland"), Mr. Geo. Napier, Mr. Wm. Lang, Mr. John Morison, junr., Mr. Wm. Scotland (the originator of caravan touring in the West of Scotland), and Mr. Charles Reid, of Wishaw (with his admirable animal studies).

Kindred photographic associations are lending a helping hand, and all are working with a zeal that must ensure an exhibition of more than ordinary interest, not only in pictures, but likewise in the latest novelties in the way of apparatus, ample space for which has been provided by the executive.

The Exhibition will open on the 1st of September with a full-dress evening *conversazione*, at which the Lord Provost will preside, and invitations to a very large number of professional and leading citizens of the West of Scotland have been issued. Musical promenades will be given at intervals, and Messrs. Ferguson and Forrester will take charge of the refreshment stalls. Altogether, the month of September should be a very attractive time for those desirous of spending a profitable and pleasant day or evening at the Fine Art Institute.

Mr. Wm. Gordon, the secretary of the Association, will readily furnish information regarding the undertaking on application to him at 3, Lynedoch Street. Intending exhibitors should note that the last date for receiving entry forms is the 20th inst., and the last day for sending in exhibits is the 22nd inst.

Loosening Glass Stoppers. — *The Pottery and Glassware Reporter* states that some one of the following methods is certain to prove effective:—(1) Hold the bottle or decanter firmly in the hand or between the knees, and gently tap the stopper on alternate sides, using for the purpose a small piece of wood, and directing the strokes upward. (2) Plunge the neck of the vessel in hot water, taking care that the water is not hot enough to split the glass. If the stopper is still fixed, use the first method. (3) Pass a piece of lint around the neck of the bottle, which must be held fast while two persons draw the lint backward and forward. (4) Warm the neck of the vessel before the fire, and when it is nearly hot the stopper can be removed. (5) Put a few drops of oil around the stopper where it enters the glass vessel, which may then be warmed before the fire; then apply process No. 1. If the stopper still continues immovable, repeat the above process until it gives way, which it is almost sure to do in the end. (6) Take a steel pin or needle and run it round the top of the stopper in the angle formed by it and the bottle. Then hold the vessel in your left hand and give it a steady twist towards you with the right, and it will very soon be effectual. If this does not succeed, try process No. 5, which will be facilitated by it.

# Notes.

The art of tattooing is a universal oue, being practised by savages as well as civilised beings. Mauy boys at school have undergone the process with the help of a needle to make the pricks, and a little gunpowder rubbed in to afford the necessary colouring. In some of our sea-ports tattooing is a regular trade, the tattooist being an artist who will, for a certain sum, depict any kind of device on the brawny breast or arm of the jolly tar. It may be that during the process, which is by uo means destitute of pain, the tar may lose his jollity, and we have the authority of the late Maddison Morton, the author of "Box and Cox" and a hundred other farces, that the aspect of the jolly tar when he is not jolly is a picture of misery which it is indeed hard to beat.

But the tar need no longer suffer the pains of the tattooing needle, for an iugenious gentleman who hails from Chicago has found out how to impress indelible pictures on the human skin by the aid of photography. We do uot know the particular process by which he works, but there are several ways in which the pictures might be printed on the skin. As to their permanence when compared with tattooing, we have our doubts, for, in the older process, the pigment is actually urged beneath the cuticle, and the photograph can hardly be anythiug more than a surface discolouration. It is said that the young men of Chicago are setting the fashion of having their sweethearts' portraits printed on their arms in this fashion, aud to the fickle the want of permanence will not be regarded as a disadvantage. This new method of photographic vaccination could certainly be turned to good account in an action for breach of promise, and we can imagine the scorn with which the counsel for the plaintiff would direct the defendant to bare his arm.

A writer in *Tit-Bits*, in the course of a paper which describes the manner in which the nobility increase their iucomes, alleges that there is a certain noble lord who fiuds in amateur photography not only a pleasurable hobby, but a source of profit. "Armed with an instantaneous camera fitted with all the latest improvements, he secures portraits of all his friends and acquaintances, and puts them away for future use." The future use is iudicated when one of these persons dies "or in any other way acquires notoriety." The noble lord then betakes himself to an eminent firm of photographers in London, and sells the negative of his friend, for which he is paid a sum of money varying from twenty to one hundred pounds. In a recent divorce case in which one of his friends was implicated he received as much as one hundred and fifty ponnds. Were the story true, the noble lord would certainly represent the meanest and most contemptible of mortals; but, as any practical man must kuow, it is a barefaced fabrication from begiuning to end.

A correspondent recently called the attention of our readers to the absence of titles on photographic views purchased on the Continent, and also in this country. In some cases the titles were there, but were clearly wrong and belonged not to the scenes to which they were attached, but in most others they were absent altogether. We quite agree with him that such pictures should bear their title on their face; but this should certainly be done in an unconspicuous manner. We have seen several pictures which, in our opinion, are spoilt by the glaring words in white letters which blot out part of the foreground, and when a lantern-slide has a title upon it of this nature the effect, when projected upon the screen, is equally deplorable. The illusion is spoilt by the presence of these white disfigurements, and photographers would do well to adopt some better plan. A painter, in signing a picture, does so in an unobtrusive manner in one corner, and the signature has to be songht for; it is not at once apparent. Cannot photographers take a hint from this laudable custom?

We suppose the public take an interest in the rough portraits of notorieties which appear in some of the evening and weekly newspapers, or proprietors would not go to the expense of having them prepared. From an artistic point of view they are deplorable, and one is often tempted to regret that photography puts it in the power of artists to commit such atrocities. We are, of course, aware of the difficulties which surround newspaper portraiture: the coarse paper, the rapid printing, the cheap ink, all are obstacles to which the artist must accommodate himself as best he may; but all these drawbacks in no way excuse the results, or render them less depressing to look upon.

Iu America newspaper portrait atrocities have reached even a lower depth, and we are quite in accord with the *Chicago Inland Printer*, which, in its anguish, writes as follows:—"From the advent of the first portrait of Lydia Pinkham to the distorted caricatures of the late Canadian Premier, the deadly newspaper cut has struck its paralysing force into the brains of old and young. No one can take up a paper without meetiug the ghost of an abortive attempt at a portrait of some kind in infinite variety. From the president down to the man as he looked 'before and after taking,' they tend to breed an anarchism of sensation sufficient to demoralise the strongest intellect." Accompanying this outburst are two portraits, one as it was originally drawn, and the other as it appeared after engraving and printing. As the *Inland Printer* is exquisitely printed on superb paper, every chance is given to the abortion. What it must have looked like in an ordinary newspaper imagination can scarcely picture.

The director of the Astronomical Observatory of Harvard College calls attention, in his annual report, to the need of a fire-proof building for the storage of photographic plates. The Observatory has received iu the last year about nine thousand such plates—some taken in Peru, some in California, and some in Cambridge—aud it has in all about twenty-seven thousand of them. They represent the entire sky from the North to the South Pole, the greater portion of it being covered several times, and they show the spectra as well as the position of the stars. A large part of the charts and nearly all the spectra are unique, not having been photographed elsewhere. It is very certain that such a collectiou must be exceedingly valuable. There is also also this to be remembered, that a photograph once destroyed can never be replaced. Even two photographs taken at the same time, and nuder similar circumstances, can possess points of difference. A fire-proof building as recommended is of the highest importance.

## INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT CARDIFF.

[BY OUR SPECIAL COMMISSIONER.]

My first impression on reaching Cardiff was, that it was such a prosperous town, and its inhabitants so busily engaged in making money, that they had little or no time to devote to art matters. For the sake of the energetic men who form the committee of the Cardiff Photographic Society it is to be hoped that I am wrong. The visit of the British Association to this rapidly growing Welch seaport must bring a large number of people specially interested in all matters, both scientific and artistic, and the occasion is, therefore, a fit one to bring together as large a collection as possible to illustrate one of the most wonderful scientific developments of the Victorian era, and is quite in harmony, therefore, with the efforts of this celebrated migratory scientific association, and should be a great success.

Cardiff is famed for its arcades, which have somewhat of a Parisian aspect. In their construction the people have shown great wisdom, for so much rain falls in this corner of the British Isles, and it is of such a fine, penetrating character, if I may judge by the sample supplied for my discomfort, that I was glad to make use of the one which led to the hall devoted to the Photographic Exhibition.

So much work has to be done in a short space of time that it is no reproach to the Society to say that it was impossible to get a catalogue on the opening day. Through the courtesy of the energetic secretary, Mr. Faulks, I was enabled to have the use of the rough proof just hot from the printers, and should by chance, therefore, any of the names be wrong, this must be my excuse. The hall is a lofty one with arched roof and glass along its centre, and the pictures on the walls show extremely well. Some of those on the screens are not quite so fortunate, for the light is too directly overhead to do full justice to them.

On walking round the room, old friends met the eye at every turn—I mean pictures that had become so by long acquaintance. Of course this is inevitable in a country exhibition, for prize winners will send pictures likely to win prizes, and a very thin exhibition would result from restrictions like those practised at Pall Mall. There was no formal opening, and I was glad of it, for it gave me an opportunity of hearing Mr. Paul Lange's second lecture. The one on Norway was quite equal to the one on Iceland I had the pleasure of hearing at Gloucester a few months ago, and the slides to illustrate it, if not more interesting, were certainly more attractive. After hearing the lecture, which was full of interest from beginning to end, I felt sure that shoals of hand-cameras would be found careering up and down the beautiful fiords next summer.

The splitting the pictures into so many classes has one very serious evil: it makes medals too cheap. Pictures in no way worthy of recognition take rank with the productions of the best workers in the country simply because they happen to come into some out-of-the-way class, or into one with very few entries. It thus happens that the accidental shots of some hand-camera, as far as the awards are concerned, take precedence of the well thought-out, artistic work of the most distinguished artist. It certainly makes one wish that awards were done away with altogether.

The entries for professional portraits are very few. Mr. W. W. Winter is well to the front with his powerful work, and Prince Ruffo (only think of it, a prince among the professionals, and we in England can only boast of one baronet!) has distinguished himself by two or three of the most perfect heads possible. One of these is evidently a Doge of Venice, and, if this were not a serious journal, and the remark might be taken as an attempt at a very obvious joke, I would like to ask what dodge he employed to give such life and reality to this "grave and reverend segnior" as to bring him before us in the habit of the time in which he lived, which must be some 300 years past and gone. The time-furrowed and care-worn face of the abbess is not quite so striking, but equally fine.

The work of Mr. J. H. Hogg scarcely comes under the head of portraits, for there are successful attempts at picture-making in several of them. In one called "The Young Owl," a delightfully crummy young lady is stretching out her hand slightly above her reach to tempt the learned-looking inmate of the cage. She has something in the hand for the bird, but it is such a beautiful little dumpling of a hand that I am surprised such a wise looking creature did not seize hold of it instead of deliberating whether it should or should not take the offered food.

Mr. H. P. Robinson's "What is it?" might be called landscape with figure. A bull, with forelegs firmly planted, and head erect, is watching with indignant surprise the audacious attempt of the artist—fortunately for him on the other side of the stream—to produce his portrait without permission, and without any attempt to regulate the question of copyright. No wonder he looks so angry. The landscape is well selected, but the bull makes the picture. There are several more equally good, but they have been described before.

There are some capital interiors by Mr. Court Cole, and those by Mr. T. H. Faulks must not be passed over, for he has successfully dealt with very difficult subjects.

Mr. Robert Terras has very cleverly concealed his art in his two Astade-like, homely interiors, and he is deserving of the highest praise. I know the work of this gentleman pretty well, but am compelled to say that he has surpassed himself.

Mr. Bernard Alfieri is most successful with his pictures of animals. All are good, and the cattle in the shallow stream, evidently enjoying its cooling influence, would delight the eye of the veteran Sydney Cooper.

Looking over the catalogue, I saw the title of a picture that I felt sure would interest me. It was called "A Gutter Race," and I immediately looked for a picture which I felt certain only Rejlander could have successfully dealt with, but I looked in vain. A reference to the number in the catalogue took me to a very different kind of subject, a yacht race on a cloudy, uncertain day—a capital picture, one of the best of its kind in the room. It was simply a misprint, and should have been "cutter" instead of "gutter." Mr. W. H. Kitchin deserves praise for this clever little picture, for it is low in tone, and well expresses the feeling of the scene. The Champion Class is filled by old favourites, but they have all been described before, and do not call for further mention.

Mr. Horsley Hinton has followed in the steps of Mr. Davison, and has produced several *fuzzy* pictures, the best of which is "By Reedy Ways," for it is a very harmonious and artistic bit of light and shade, particularly when the beholder gets far enough away that he does not see the *modus operandi*.

"Evening at Cannes" is a very artistic little picture by H. Haughton. A break in the sky just before sunset reveals the town and distant hills, but all the rest of the picture is gloom. An inch off the forground, which is uninteresting, would convert this picture into a perfect little gem.

"Brotherly Attention" must not be passed over, though it is only two little nigger boys sitting on a boat. An old kettle and a worn-out tin pan are at their feet, and the elder one is carefully removing superabundant secretion at the tip of the younger one's nose with not the very cleanest of pocket-handkerchiefs. This picture is deliciously comic, but not at all vulgar.

Mr. J. E. Dumont has told his story with great boldness in his picture called "A Good Hand." A jolly priest, with skull cap to cover his shaven crown, is busy with his hand at whist or cribbage, and quite disregards the Chianti flask and very nearly empty glass by his side. The triumphant look on his face shows that he holds the winning card.

Mr. G. Tagliaferro's accessories are decidedly too much *en evidence* in his circus pictures; but he is most fortunate in his model who enacts the clown, for the love-struck expression when looking at the trim ankles of the *première danseuse* is extremely comic, though very true to life. The lady is apparently unconscious of the effect she is producing, for she has one of her feet on the drum and is busily occupied in fastening up her sandal.

Space does not permit much more, but the geological pictures by Mr. W. L. Howie must not be passed over. They illustrate the errosive action of rain on the softer parts of some strata, and the formation thereby of sharply pointed pyramids. A clear but concise description is attached to each frame.

A large series of pictures illustrating the district, and forming an extensive contribution to the county survey now on hand, are arranged in an outer gallery, and are most interesting. The wheeled Runic crosses that are unearthed from time to time deserve particular attention.

List of Awards.*

*Class* 1.—Portraiture. (8) W. W. Winter, silver medal; (24) Prince Ruffo, bronze medal; (17) J. H. Hogg, certificate.

*Class* 2.—Landscape. (49) J. P. Gibson, silver; (59) H. P. Robinson, bronze; (44) T. Birtles, certificate.

*Class* 3.—Architecture. (117) C. Court Cole, silver; (107) T. H. Faulks, bronze; (102) A. J. Loughton, certificate.

*Class* 4.—Genre. (135) Robert Terras, silver; (130) J. E. Austin, bronze; (138) Shapoor N. Bhedwar, certificate.

*Class* 5.—Enlargements. (179) West and Son, silver; (173) W. H. Kitchin, bronze; (154) T. B. Sutton, certificate.

*Class* 6.—Hand-Camera Work. (212) Percy Morris, silver; (220) J. D. Lysaght, bronze; (203) W. D. Welford, certificate.

*Class* 7.—Animals. (226) Bernard Alfieri, silver; (230) W. D. Welford, bronze; (228) Mrs. Pollard, certificate.

*Class* 8.—Instantaneous. (250) Henry Symonds, silver; (247) W. H. Kitchin, bronze; (242) A. R. Dresser, certificate.

*Class* 9.—Lantern Slides. John E. Austin, silver; Mr. and Mrs. Auckorn (No. 2 set), bronze; J. D. Lysaght, certificate.

*Class* 9a.—Lantern Slides. E. G. Lee, silver; Jas. Dore, bronze; A. Pringle, certificate.

*Class* 9b.—Lantern Slides. A. Pringle, silver; E. Beck, bronze; T. H. Faulks, certificate.

*Class* 9c.—Lantern Slides. Priestley and Sons, silver; West and Sons, bronze; James Dore, certificate.

*Class* 10.—Champion Class. Shapoor N. Bhedwar, gold medal for series "Feast of Roses."

*Class* 11.—Portraiture. (375) Miss Rose Collier, silver; (382) W. J. Jenkins, bronze; (362) Clarence B. Moore, certificate.

*Class* 12.—Landscape. (409) A. Horsley Hinton, silver; (446) Hamilton Emmons, silver; (399) A. R. Dresser, bronze; (405) Henry Holt, certificate.

*Class* 13.—Genre. (466) J. E. Austin, silver; (493) J. E. Dumont, bronze; (506) T. M. Brownrigg, certificate.

*Class* 14.—Landscape—Six ¼-plates. (516) W. L. Howie, silver; (515) W. H. Kitchin, bronze; (513) John E. Austin, certificate.

*Class* 15.—Society Competition, Lantern Slides. No competition.

*Class* 16.—President's Prize. (532) W. H. Kitchin, (537) C. H. Murrell, equal first.

Special Award. W. L. Howie, bronze medal for Geological Photographs—Nos. 543, 544, 545.

The Judges were Valentine Blanchard, Gambier Bolton, F.Z.S., and Paul Lange.

The Survey Competitions.

Classes competing for the medals offered by the committee of the Free Library and Museum in reference to the Photographic Survey of Glamorganshire and part of Monmouthshire.

*Class* 1.— Collection illustrating Glamorganshire past and present:— Gold medal, T. M. Franklin; silver medal, W. Booth; bronze medal, A. M'Kinnon.

Mr. Franklin's collection, both for number and selection of subjects and excellence of workmanship, is a model of what such survey work should be.

Mr. Booth's collection falls short of the standard in technical excellence, but the examples include so many subjects necessary for the survey that it is considered to stand second, but with a long interval. Mr. M'Kinnon's collection is only lacking in number of subjects in the more distant parts of the county.

*Class* 2.— Collections illustrating Monmouthshire, within twelve miles of Cardiff:—Silver medal, W. Herbert; bronze medal, N. R. Corfield.

Mr. Herbert's collection presents an interesting series, but does not include any important object or view in Newport or Carleon; but the more inaccessible subjects count as of higher value to the survey.

Mr. Corfield presents a few interesting examples, but is too restricted in number to be a representative collection.

*Class* 3. — Collections of photographs of churches and chapels of Glamorganshire:— Silver medal withheld; bronze medal, W. Booth.

The adjudicators take the view that these medals are offered for collections not of ancient churches exclusively, but as representing the buildings used for religious worship at present in the county. No collection offered does this satisfactorily; the chief medal is, therefore, withheld.

Mr. Booth presents a few examples, and the bronze medal was therefore adjudged to him.

*Class* 4.— Collection of photographs of Cardiff, past and present:— Silver medal, G. Wills; bronze medal, F. W. Simpson.

The collection of Mr. Wills is of the greatest merit, judged from the point of view of the survey, while the artistic excellence is not less. The few remaining nooks of old Cardiff have been carefully searched out and photographed.

Mr. Simpson's collection represents the more obvious points of interest in the town, in a series of photographs of striking merit.

*Class* 5.— Collections of photographs of Glamorganshire castles, mansions, religious houses, and crosses:—Silver medal, T. M. Franklin; bronze medal, T. H. Faulks.

Mr. Franklin's exhibit, comprising so many subjects inaccessible to most photographers, and his examples of Celtic crosses, represented with such remarkable success on so large a scale, forms a collection of high value.

Mr. Faulks' small collection is varied and well selected in subject, and is adjudged the bronze medal.

The adjudicators look upon the collections exhibited as satisfactory considering the short time during which the survey has been going on, and the unfavourable weather of the past and present seasons. The number of views of the same object taken by members of the Society is to be regretted as a waste

* Class 1 to 10, amateur and professional; class 11 to 14, amateur.

of energy, while many subjects within the purlieus of the survey remain unrepresented.

The western portion of the county, too, is quite unworked. Sufficient, however, is shown to indicate that great energy and skill have been devoted to the task, and to promote the completion of the survey in a satisfactory manner.

It has occurred to the adjudicators whether it would be thought advisable by the committee to award the silver medal withheld to the best selection of views illustrating the castles immediately round Cardiff, viz., Cardiff, St. Fagan's, and Castell Coch.

In such case they would recommend the five series exhibited by Mr. Dighton, which, being confined to the castles named, does not conform to either of the clauses described in the schedule. (Signed per pro.) W. H. Johnston.
T. H. Thomas.

## MEETING OF THE BRITISH ASSOCIATION AT CARDIFF.

In his inaugural address as President of the British Association, which is now meeting at Cardiff, Dr. Wm. Huggins, the astronomer, said:—

The new power which modern photography has put into the hands of the astronomer is great, and has led already, within the last few years, to new acquisitions of knowledge of vast importance, and the recent great successes in astronomical photography are not due to greater skill, nor, to any great extent, to superior instruments, but to the very great advantages which the modern gelatine dry plate possesses for use in the observatory over the methods of Daguerre, and even over the wet collodion film on glass, which, though a great advance on the silver plate, went but a little way towards putting into the hands of the astronomer a photographic surface adapted fully to his wants.

The modern silver-bromide gelatine plate, except for its grained texture, meets the needs of the astronomer at all points. It possesses extreme sensitiveness; it is always ready for use; it can be placed in any position; it can be exposed for hours; lastly, it does not need immediate development, and for this reason can be exposed again to the same object on succeeding nights, so as to make up by several instalments, as the weather may permit, the total time of exposure which is deemed necessary.

Without the assistance of photography, however greatly the resources of genius might overcome the optical and mechanical difficulties of constructing large telescopes, the astronomer would have to depend in the last resource upon his eye. Now, we cannot by the force of continued looking bring into view an object too feebly luminous to be seen at the first and keenest moment of vision; but the feeblest light which falls upon the plate is not lost, but is taken in and stored up continuously. Each hour the plate gathers up 3,600 times the light-energy which it received during the first second. It is by this power of accumulation that the photographic plate may be said to increase, almost without limit, though not in separating power, the optical means at the disposal of the astronomer for the discovery or the observation of faint objects.

Two principal directions may be pointed out in which photography is of great service to the astronomer. It enables him, within the comparatively short time of a single exposure, to secure permanently with great exactness the relative positions of hundreds or even of thousands of stars; or the minute features of nebulæ or other objects; or the phenomena of a passing eclipse, a task which, by means of the eye and hand, could only be accomplished, if done at all, after a very great expenditure of time and labour. Photography puts it in the power of the astronomer to accomplish in the short span of his own life, and so enter into their fruition, great works which otherwise must have been passed on by him as an heritage of labour to succeeding generations.

The second great service which photography renders is not simply an aid to the powers the astronomer already possesses. On the contrary, the plate, by recording light-waves which are both too small and too large to excite vision in the eye, brings him into a new region of knowledge, such as the infra-red and the ultra-violet parts of the spectrum, which must have remained for ever unknown but for artificial help.

The present year will be memorable in astronomical history for the practical beginning of the photographic chart and catalogue of the heavens, which took their origin in an international conference which met in Paris in 1887, by the invitation of M. l'Admiral Mouchez, Director of the Paris Observatory. The decisions of the Conference in their final form provide for the construction of a great photographic chart of the heavens, with exposures corresponding to forty minutes' exposure at Paris, which, it is expected, will reach down to stars of about the fourteenth magnitude. As each plate is to be limited to four square degrees, and as each star, to avoid possible errors, is to appear on two plates, over 22,000 photographs will be required.

With an exposure sufficiently long for the faintest stars to impress themselves upon the plate, the accumulating action still goes on for the brighter stars, producing a great enlargement of their images from optical and photographic causes.

The remarkable successes of astronomical photography, which depend upon the plate's power of accumulation of a very feeble light acting continuously through an exposure of several hours, are worthy to be regarded as a new revelation. The first chapter opened when, in 1880, Dr. Henry Draper obtained a picture of the nebula of Orion; but a more important advance was made in 1883, when Dr. Common, by his photographs, brought to our knowledge details and extensions of this nebula hitherto unknown. A further disclosure took place in 1885, when the Brothers Henry showed for the first time, in great detail, the spiral nebulosity issuing from the bright star Maia, of the Pleiades, and, shortly afterwards, nebulous streams about the other stars of this group. In 1886 Mr. Roberts, by means of a photograph to which three hours' exposure had been given, showed the whole background of this group to be nebulous. In the following year Mr. Roberts more than doubled for us the great extension of the nebula region which surrounds the trapezium in the constellation of Orion. By his photographs of the great nebula in Andromeda he has shown the true significance of the dark canals which had been seen by the eye. They are, in reality, spaces between successive rings of bright matter, which appeared nearly straight owing to the inclination in which they lie relatively to us. These bright rings surround an undefined central luminous mass. Some recent photographs by Mr. Russell show that the great rift in the Milky Way in Argus, which to the eye is void of stars, is, in reality, uniformly covered with them.

The heavens are richly, but very irregularly, inwrought with stars. The brighter stars cluster into well-known groups upon a background formed of an enlacement of streams and convoluted windings and intertwined spirals of fainter stars, which become richer and more intricate in the irregularly rifted zone of the Milky Way. We, who form part of the emblazoury, can only see the design distorted and confused—here crowded, there scattered, at another place superposed. The groupings due to our position are mixed up with those which are real. Can we suppose that each luminous point has no closer relation to the others near it than the accidental neighbourship of grains of sand upon the shore, or of particles of the wind-blown dust of the desert? Surely every star, from Sirius and Vega down to each grain of the light-dust of the Milky Way, has its present place in the heavenly pattern from the slow evolving of its past. We see a system of systems, for the broad features of clusters and streams and spiral windings which mark the general design are reproduced in every part. The whole is in motion, each point shifting its position by miles every second, though, from the august magnitude of their distances from us and from each other, it is only by the accumulated movements of years or of generations that some small changes of relative position reveal themselves.

The deciphering of this wonderfully intricate constitution of the heavens will be undoubtedly one of the chief astronomical works of the coming century. The primary task of the sun's motion in space, together with the motions of the brighter stars, has been already put well within our reach by the spectroscopic method of the measurement of star-motions in the line of sight.

Many other problems of the newer side of astronomy would claim attention if time permitted. The researches of the Earl of Rosse on lunar radiation, and the work on the same subject and on the sun by Langley. Observations of lunar heat with an instrument of his own invention by Mr. Boys, and observations of the variation of the moon's heat with its phase by Mr. Frank Very. The discovery of the ultra-violet part of the hydrogen spectrum, not in the laboratory, but from the stars. The confirmation of this spectrum by terrestrial hydrogen in part by H. W. Vogel, and in its all but complete form by Cornu, who found similar series in the ultra-violet spectra of aluminium and thallium. The discovery of a simple formula for the hydrogen series by Balmer. The important question as to the numerical spectral relationship of different substances, especially in connection with their chemical properties; and the further question as to the origin of the harmonic and other relations between the lines and the groupings of lines of spectra. On these points contributions during the past year have been made by Rudolf v. Kövesligothy, Ames, Hartley, Deslandres, Rydberg, Grünwald, Kayser and Runge, Johnstone Stoney, and others. The remarkable employment of interference phenomena by Professor Michelson for the determination of the size, and distribution of light within them, of the images of objects which, when viewed in a telescope, subtend an angle less than that subtended by the light-wave at a distance equal to the diameter of the objective—a method applicable not alone to celestial objects, but also to spectral lines and other questions of molecular physics.

Photographic Club.—Subject for August 26th, "Films"; September 2nd, "Testing Lenses." Outing Saturday next, August 22nd, Cobham (Surrey). Train from Waterloo at 2.27.

Photographic Society of Great Britain. — Technical meeting at 8 p.m. on August 25th; subject for discussion, "Printing Processes."

## THE DECOMPOSITION OF SILVER CHLORIDE BY LIGHT.

BY A. RICHARDSON, PH.D.

Although the fact that silver chloride darkens on exposure to light has long been known, the composition of the product formed has not yet been satisfactorily determined; the observation of Schelle, however, that the darkening process is accompanied by an evolution of chlorine, leads to the conclusion that the substance formed is either a subchloride or an oxychloride of silver, whilst its sparing solubility in dilute nitric acid seems to preclude the possibility of the reduction of the chloride to metallic silver.

Fischer, in 1814, assumed that the darkened product was a subchloride, and this idea has been generally accepted until recent years. When, however, doubt was cast on the existence of Wöhler's silver suboxide by the experiments of Muthman (*Ber.*, 1887, 20, 983), and of Bailey and Fowler (Trans. 1887, 51, 416), and the existence of the suboxide of Pfordten (*Ber.*, 1887, 20, 1458, 3375; 1888, 21, 2288) was disproved by Freidheim (*Ber.*, 1887, 20, 2554), the evidence in favour of the subchloride theory was somewhat shaken. Quite recently, however, Güntz (*Compt. Rend.*, 112, 861) claims to have obtained silver subchloride by the action of gaseous hydrogen chloride on silver subfluoride, as also the suboxide and other similar compounds; the subchloride so obtained has not, however, been identified with the darkened product formed by the action of light on silver chloride.

The other view, namely, that the compound formed is an oxychloride of silver, has lately been received with considerable favour, and seems to be supported by some experiments of Dr. Hodgkinson, in which the presence of the oxychloride appears to have been detected in the darkened compound (Meldola, "Chemistry of Photography," p. 856). As, however, the evidence in favour either of the subchloride or oxychloride theory is far from conclusive, it was thought desirable to examine the darkened silver chloride in order to determine whether it contained oxygen, and further, to study the decomposition of the chloride when exposed to light under water.

The silver chloride used in all the experiments was obtained by adding hydrochloric acid to a solution of pure silver nitrate, the precipitate being washed by decantation till free from acid.

*Action of Silver Chloride on Water when Exposed to Light.*—In the early experiments, the chloride was exposed to light in sealed tubes containing water, the space above being occupied by air. When opened after long exposure (about six months), it was found that a considerable quantity of gas had been formed, and that it contained sufficient oxygen to rekindle a glowing match (8 grams of the chloride gave 7 c.c. of gas). The evolution of oxygen under these conditions was confirmed by later experiments, and was studied more closely in conjunction with the other changes which occur.

An experiment is recorded by Robert Hunt ("Researches on Light," p. 81), in which absorption of gas was observed to take place when the chloride was darkened, leading him to the conclusion that the product contained oxygen; the conditions, however, were somewhat different, and this may account for the want of agreement between our results.*

During the exposure of the chloride under water, it

* It does not appear that in Hunt's experiment a large volume of water was present.

had been frequently observed that the volume of liquid present exercised a considerable influence on the rate at which the substance darkened; this point was, therefore, further investigated. The exposure of the chloride was made in tubes closed at one end, and so arranged that any gas which might be evolved would expel a portion of the water by an exit tube terminating in a bulb, in which it was collected. Four tubes of this form, having a capacity varying from 57 c.c. to 350 c.c., were filled completely with water containing equal quantities (5 grams) of silver chloride in suspension. After half an hour's exposure to bright sunlight, bubbles of gas collected in the tube, and continued to be evolved till the end of the experiment. The gas was measured after eight days' exposure (April 10-17), and the liquid was examined for free* chlorine by the addition of potassium iodide and titration with N/10 sodium thiosulphate in the usual way. The total chlorine was also estimated, the combined chlorine being found by difference. In determining the total chlorine, the method adopted in all cases was to add sulphur dioxide to a known volume of the liquid, the excess being removed by potassium chromate; sodium hydrate was next added, and the solution boiled; the precipitated chromic hydrate was filtered off, and the liquid and washings made up to known volume; the chlorine was then estimated with N/10 silver nitrate solution, the liquid having been previously acidified with dilute nitric acid, and neutralised with sodium carbonate.

This method was found to give good results provided the reagents used were free from chlorine. The results are given in the following table:—

Table I.

| 1. $H_2O$. | 2. O at 0° and 760 mm. | 3. Total Cl. | 4. Combined Cl. | 5. Free Cl. | 6. HCl in 100 parts of solution. |
|---|---|---|---|---|---|
| c.c. | c.c. | gram | gram | gram | gram |
| 57 | 4·02 | 0·097 | 0·092 | 0·005 | 0·162 |
| 121 | 5·74 | 0·124 | 0·122 | 0.0017 | 0·101 |
| 152 | 5·94 | 0·127 | 0·126 | 0·0010 | 0·083 |
| 356 | 6·61 | 0·142 | 0·142 | 0·0000 | 0·039 |

It will be seen that the effect of an increasing volume of water is to increase the total quantity of chlorine in solution, and therefore the amount of silver chloride decomposed; also to increase the total amount of hydrochloric acid formed and of oxygen liberated;† there is, however, a diminution in the amount of free chlorine present. Further, it is seen, on calculating the strength of acid per 100 parts of water (Column 6), that the strongest acid is found in the tube containing the smallest quantity of water, and it is here also that the largest quantity of free chlorine is present. The strength of acid and the amount of free chlorine therefore decrease as the volume of water increases.

As the decomposition of silver chloride by light is to a large extent dependent on the proportion of free chlorine present, the conditions which regulate its conversion into hydrochloric acid in the solution were studied.

*(To be continued.)*

The Royal Cornwall Polytechnic's exhibition opens on Tuesday next at Falmouth, lasting four days.

* The "free" chlorine is not necessarily present entirely as such, but may exist partly in the form of oxygen acids of chlorine.

† This only represents a portion of the oxygen formed, as the amount of gas dissolved in the water was not determined.

## LUNAR AND TERRESTRIAL VOLCANOES.

The following article by the Rev. H. N. Hutchinson, B.A., F.G.S., appears in the current number of our contemporary *Knowledge*. It will be interesting to our readers because the writer's conclusions are drawn from photographs of the moon. Excellent collographic reproductions of the original photographs appeared in a former number:—

Readers of *Knowledge* will not have forgotten the Editor's interesting paper in the May number of last year on "The Great, Bright Streaks which Radiate from some of the larger Lunar Craters." It has been suggested to me that the question of the origin of these remarkable streaks might be discussed from the geological point of view, and that I should present some facts with regard to the lines of fracture and displacement among the stratified rocks of the earth's crust which are known amongst geologists as "faults." Geological science has received valuable aid from astronomers, and possibly there are questions in astronomy on which geologists might throw some light; at all events, it is a good thing occasionally that students of one science should endeavour to throw light on another. I only regret that the subject is not handled by one more deeply versed in lunar questions.

In my previous paper on "The Cause of Volcanic Action," I mentioned the connection between volcanoes, mountain-chains, and lines of weakness in the earth's crust, which are closely connected with lines of fracture; and this would seem a fitting opportunity for turning our thoughts to those remarkable outbursts of volcanic action on a prodigious scale of which the moon's numerous craters stand as silent yet speaking witnesses, and to inquire how far the cracks radiating from some of them may be compared with terrestrial cracks.

In Mr. Ranyard's paper we find a summary of the opinions put forward by different authorities on the subject of lunar streaks. "There are certainly seven such ray systems," he says, "all with craters at their centres, namely: Tycho, Copernicus, Kepler, Byrgius, Anaxagoras, Aristarchus, and Olbers." Of these, Tycho is the most conspicuous example; its radiating streaks come out well in lunar photographs. The radiating streaks from Copernicus are well seen in the second photo in the December number of 1890. Two of the longest from Tycho extend to a distance of over one thousand miles from the crater. Nichol thought, as Mr. Ranyard tells us, that they were composed of matter shot up from the interior of the moon; and compares them to mineral veins or to "trap-dykes" (of basalt or other igneous rock), such as are known to pierce the sedimentary strata upon earth.

Nasmyth's opinion was that the radiations "are cracks divergent from a central region of explosion, and filled up with molten matter from beneath." His experiment with a glass globe to illustrate this is described in the above paper (p. 130), also in Nasmyth and Carpenter's book on the moon (1874, p. 134). "Proctor seems to have favoured the trap-dyke theory. Neison, after carefully setting out the observed facts, refrains from advancing any theory." Young hesitates between this theory and the idea that they may be mere surface markings. Mr. Ranyard himself thinks "that they correspond to a series of radiating cracks, or faults, from which comparatively warm air issues charged with aqueous vapour, which is deposited as hoar-frost on either side of the vent."

Thus there seems to be a consensus of opinion that, in some way or other, the radiating streaks are due to cracks, and we can only conceive of such fractures as being due to a disruptive action, originated by the reaction of the interior of the moon upon its outer crust. Taking so much for granted, we may pass on to the question of the nature of the disruptive force. Was it due—as Messrs. Nasmyth and Carpenter say—to the expansion of molten rocky matter below the moon's surface on nearing the point of solidification? Or was it originated by the cooling and consequent contraction of the body of the moon, which would leave the outer crust here and there unsupported, and hence this crust, in settling down and endeavouring to adapt itself to a smaller surface below, would undergo tangential strains and thrusts which, it is easy to conceive, might result in a certain amount of fracturing? A simple illustration of this is afforded by the wrinkling of the skin of an apple as it dries. The soft pericarp below shrinks as it loses water, and so the skin has to settle down and accommodate itself to a smaller surface, and in doing so it must inevitably be wrinkled, or thrown into folds. This is a view which might, perhaps, commend itself to a geologist, for it is on a similar theory that geologists explain the great foldings which have produced terrestrial mountain chains, which latter are clearly connected with lines of weakness or fracture such as they suppose allowed rocky matter from below (charged with steam) to well up to the surface and so give rise to volcanic action. Volcanoes, as we pointed out in our last paper, have a striking connection with mountain chains. On this view the folding, contortion, and fracturing of strata, so conspicuous in mountains, is a secondary result of the secular refrigeration of our planet. Nothing short of this seems, at present, equal to the Titanic work of upheaval. At the same time the theory is not proved, and some authorities refuse to accept it.

Let us now turn to the earth and see what geology tells us about terrestrial cracks. These are of two kinds: first, there are the "faults," to which we have already referred; secondly, the "trap-dykes," which are very numerous in Scotland and northern England.

It may easily be conceived that the force which was sufficient to raise vast masses of solid rock of immense thickness from the bottom of the sea, where they were deposited, high into the air in order to form dry land, and, moreover, to bend them into great folds and contortions of all sizes, might also be sufficient to crack and break them through. Accordingly, we find in the stratified series very frequent instances of cracks running through great thicknesses of rock, and obviously caused by disturbing force; sometimes they are mere fissures, but more frequently there is not only a severance but a displacement of the rocks that have been severed. Strata once continuous are left at very different levels on opposite sides of the fissure. Hence the term "fault." Some of the "faults" known to geologists are not only of great horizontal length as traced along the surface, but of very considerable depth, and have produced enormous displacements. Thus, the great Pennine "fault" of the north of England is known to be at least fifty-five miles long, and has a "throw" of 6,000 to 7,000 feet—*i.e.*, the rocks on either side have been displaced to that extent. It was probably formed at some time during the upheaval of the Pennine range of hills, which runs north and south, as the "fault" also does. The Tyndale "fault" has a throw of nearly 3,000 feet, and it runs eastwards for about fifty miles. Fractures not unfrequently occur along the axes of great folds, such as we find in mountain chains, the strata having snapped under the great tension to which they were subjected during upheaval. Thus, we find "faults" running parallel with some of the great mountain chains of the world—the Alps and Himalayas are cases in point.

This connection between great terrestrial cracks and important mountain ranges is only what might have been expected. The Unita Mountains of Wyoming and Utah consist of one broad, flattened fold, with a displacement, in places where the uplift has been greatest, of 20,000 feet! If the lunar streaks under consideration are due to "faults," it is difficult to understand how the level on each side should be so little disturbed. As a general rule, the brightness of the lunar surface corresponds to the altitude of the ground. Mr. Ranyard says the rays do not correspond to lofty ridges, or even to ridges a few hundred feet in altitude, for no ridges casting shadows as the sun rises and sets can be detected as coincident with the streaks. It seems generally admitted that they do not correspond to lava-streams, for the rays run across mountains and plains, and even through the rings and cavities of old craters.

(*To be continued.*)

Wayzegoose and Presentation.—On Saturday, Aug. 15th, the employées of Messrs. Percy Lund and Co. held their annual wayzegoose at Morecambe. Two saloon carriages were engaged, and the railway journey from Bradford was enlivened with songs and recitations. On reaching Morecambe the party divided into small companies to seek amusement in different ways, but in the afternoon they reassembled at the Regent's Park Gardens, which was the headquarters for the day. There a couple of hours were spent in various amusements, to which the wayzegoose ticket provided admission. After tea, which was served in a marquee in the gardens, short speeches were made by Messrs. Percy Lund, F. Rodger, E. Cullingford, H. Snowden Ward, W. Ethelbert Henry, and Wm. Ward; and Mr. F. Rodger and Mr. E. Cullingford, on behalf of their fellow-workers, presented to Mr. H. Snowden Ward a handsome inscribed travelling writing-desk, on the occasion of his leaving Bradford to take the management of the London branch of the business.

Glass Plates in Place of Lithographic Stones, &c.—Mr. Fred. Winterhoff, of Cologne, Germany, has invented and patented a process of preparing glass plates, which can be used in the place of lithographic stones and zinc plates, not only for printing directly or for preserving originals, but also for the preparation of impressions which can be transferred upon stone, zinc, glass, or other material. The preparation of the glass plates is simple, and may be executed by any intelligent workman. The plates occupy much less space than the lithographic stones, are cheaper, may be made of any size and quality desired, and their use requires less work and, therefore, less expense. The process consists in the covering of the glass plate with some sensitive substance—for instance, asphaltum or gelatine combined with chromate of potassium. This must be done evenly, and is allowed to dry, after which an impression taken from another plate is transferred upon the glass plate covered with the sensitive matter. The transfer paper is removed, the transfer appearing upon the plate covered with some metallic powder, like bronze or leaf metal; the space upon which the transfer has been made is now exposed to the sun for half an hour, and then washed with mineral oil. The spots which were protected from the impressions during the transfer will wash off, while the others have hardened and will adhere to the plate. After this the plate is etched very deep with hydrofluoric acid, washed off and cleaned, and is then ready for use as a printing plate. From it may be taken impressions for transfers at any time; and any number of impressions may be taken directly without wearing it out.—*Lithographic Art Journal.*

## Patent Intelligence.

### Applications for Letters Patent.

13,466. Travis Burton, 106, Cowhill, Chadderton, Oldham, "Improved Walking Stick Tripod Stand for Photographic Surveying or other purposes."—*August 10th.*

13,467. Edward Dunmore, 83, Corinne Road, Tufnell Park, London, "A Repeat Photographic Dark Slide and Improved Camera Back."—*August 10th.*

13,538. Adolphe Paul Auguste Beau, 23, Southampton Buildings, London, "Improvements in Means or Apparatus employed in Photography."—*August 12th.*

13,674. Alfred Charles Jackson, 33, Chancery Lane, London, "Improvements in or connected with Photographic Shutters."—*August 13th.*

13,686. Archibald Campbell, Southwell House, Southwell Gardens, London, "An Improved Portable Photographic Camera and Stand Combined."—*August 14th.*

13,720. Joseph Sewell, Edward Holliday, and Alfred Ernest Willey, 12, Lawrence Lane, Cheapside, London, "A Method of Producing on Veneer any Picture or Design in any Requisite Number of Colours."—*August 14th.*

13,737. Roland Smith, 1, Clapton Square, London, "Improvements in Photographic Hand Cameras."—*August 14th.*

13,764. Alfred Pumphery, 128, Colmore Row, Birmingham, "Improvements in Lantern Slides."—*August 15th.*

13,765. George Frederick Luttricke, 23, Farquhar Road, Norwood, London, "Improvements in Magic Lantern Slides."—*August 15th.*

13,799. Ole Pedersen Olvik and Hans Olsen Morken, 4, South Street, Finsbury, London, "An Improved Apparatus for the Development of Photographic Pictures."—*August 15th.*

### Specifications Published.

4,037. *March 14th*, 1890.—"Pressure-Gauge." A. T. Clarkson, 28, Bartlett's Buildings, Holborn Circus, E.C., and J. B. Spurge, 11, Reede Villas, North Street, Romford, Essex.

"Bourdon" and other gauges are filled with a liquid or jelly, which is separated from the gas under pressure by a diaphragm or piston, and a valve that closes to prevent leakage of the gas when the diaphragm breaks.

4,094. *March 15th*, 1890.—"Lamps." J. Walsh, 27, Chatto Road, Clapham Common, S.W.

*Lamp Lenses, &c.*—Relates to the construction of liquid and other lenses, and to their application to lamp globes and chimneys; and to railway carriage roof, street, and other lamps. The figure illustrates a liquid lens having flanges, which are heated and covered with cement. The lens, after immersion in water of the same temperature as the cement, is taken out and filled with water under pressure. It is then allowed to cool, and is hermetically sealed.

4,095. *March 15th*, 1890.—"Cyanides." E. Bergmann, 31, Johannisbollwerk, Hamburg.

Consists in producing cyanide of silver or copper by heating a ferrocyanide in neutral or acid solution with a silver or a copper salt. When cupric salts are used, reducing agents, such as sulphurous acids, sulphites, finely divided metals, or organic substances, must be added. Instead of soluble ferrocyanides, Prussian blue and other insoluble cyanides, raw cyanides from gas making, or ferricyanides, together with reducing agents, may be employed. Double cyanides are obtained by treating cyanide of copper with an alkaline or alkaline earthy sulphide, or with an alkaline ferrocyanide. Double salts are also obtained by treating barium-copper cyanide, obtained as above, with a sulphate or carbonate in aqueous solution.

4,178. *March 17th*, 1890.—"Photo-Mechanical Printing." G. Balagny, Paris.

The sensitive substance is spread on a flexible support, such as gelatine, collodion, celluloid, india-rubber, &c. It may be composed of bichromated gelatine, or gelatino-bromide treated with bichromate of potash, or the like. These flexible photo-type plates can be employed instead of the bichromated slab ordinarily employed in photo-mechanical processes; they are developed in a water bath, and stretched, and fixed to a rigid printing block of steel, stone, &c., by an adhesive substance, such as gelatine, dextrine, albumen, or the like. The plate is then inked and printed from in the usual way. A double impression is obtained when both silver and bichromate is used.

4,207. *March 18th*, 1890.—"Advertising and Magic Lanterns." S. J. Porter, 181, Strand, London.

*Magic Lanterns.*—The advertisement slides are carried on a revolving perforated disc which is actuated by clockwork, the advertisements being cast on a white screen of opal, &c., which carries an accumulator for an electric lamp, but gas or other light may be used.

## Correspondence.

PERSPECTIVE DRAWING AND VISION.

Sir,—It may save some discussion on a merely verbal matter if you will allow me to specify more precisely the meaning of an expression contained in the fourth paragraph of my communication in your last issue. The words "vertical measure, as before stated, does not enter into the question of binocular perspective," are intended to apply to anything that may be stated of binocular perspective or vision as differing from the monocular. That this was the intention will probably be evident to anyone who reads the paragraph from the commencement.

W. E. Debenham.

## Proceedings of Societies.

Enfield Camera Club.

The ordinary meeting of this Club was held on the 12th inst., eleven members being present. The subject for the evening was "A Discussion on Negatives," and about one hundred negatives were brought by various members for mutual criticism. A couple of hours were very profitably spent in comparing notes with reference to exposures given, developers, &c. The president (Mr. D. G. Pinkney) brought with him the latest pattern of the Beck-Newman time and instantaneous shutter, and said he had used it during a recent holiday, and that it gave great satisfaction, exposures of a fractional part of a second being made with absolute certainty, and without any vibration.

Photographers' Benevolent Association.

Meeting held at 55, Chancery Lane on the 14th inst., Mr. Jno. Spiller chairman. Present, Messrs. Berry, Freshwater, Atkinson, and Hon. Sec. Four applications for assistance considered and granted. Mr. W. J. Tabrum, solicitor, was elected assistant hon. sec. Miss Walker and Mr. Jas. Sharp, 16 and 17, Poultry, were elected subscribers.

Note.—All subscriptions are now due, and will be gladly received, as the funds are very low.

Richmond Camera Club.

At the ordinary meeting on the 14th inst., Mr. Faulkner in the chair, Mr. Cembrano, as delegate of the Club at the late meeting of the Photographic Convention at Bath, read a concise but comprehensive report of the proceedings of the Convention, calling special attention to the recommendation made by the lens standard committee with a view to securing uniformity in the matter of lenses, diaphragms, screws, and fittings of cameras, and winding up with expressions of warm appreciation of the kind reception which had been accorded to the Convention at Bath. The presentation of the report had been deferred for a fortnight to enable Mr. Cembrano to prepare his illustrations in the shape of lantern slides, with the result that no less than 120 pictures were thrown upon the screen, the slides being for the most part the work of Mr. Cembrano himself, and the rest by Mr. H. M. Hastings. They covered the whole ground of the Convention's rambles—Bath, Clifton, Bristol, Tintern, Chepstow, Salisbury, Glastonbury, Wells—and comprised architecture and landscape, shipping, cattle, and figure subjects, including in the last sundry unconventional groups of members of the Convention. The whole were of the highest interest, and Mr. Cembrano was warmly thanked by the meeting for his "illustrated report."

### Hackney Photographic Society.

The ordinary meeting was held last Thursday, Dr. Roland Smith, the president, being in the chair. The Secretary announced that the exhibition will be held in the Morley Hall (large hall) on October 21st and 22nd, and that there would be open classes, trade exhibits, lantern shows, organ recitals, concerts, &c., and that Mr. Traill Taylor and another gentleman—possibly Mr. Pringle—would act as judges. *Photography* has placed two medals at the Society's disposal, and Mr. Crouch has kindly offered a pair of stereoscopic lenses for competition.

Mr. A. Barker and Mr. Harvetson then passed round work executed by them during their holidays. Mr. B. Foulkes-Winks was nominated for membership.

The Hon. Secretary apologised for the absence of Mr. Adams, who was to have dealt with "Hand-Cameras" from a manufacturer's point of view, owing to business matters. A good show of hand-cameras was, however, made by Mr. Roberts, who showed his, the changing being effected by the dropping of plate through a slot. It could be used on a stand and focussed as an ordinary camera; no sheaths. Messrs. Phillip, Harris, and Co., of Birmingham, showed the "Cylox," a very neat and cheap camera. Dr. Roland Smith showed the one he had patented, which set the shutter and changed the plate with one movement. Messrs. Mercer, of Birmingham, sent the "Alert" (a rough model). This was a very nicely arranged and compact camera, very small, but taking quarter-plates, and on the magazine principle. Messrs. Harling sent the Cusworth repeater, which set the shutter and changed the plate with the one movement. The Hon. Sec. showed Adams's "Ideal," fitted with self-setting Newman shutter, with Iris diaphragm. The president handed round a new hand-camera lens, made by Mr. Crouch, having a focal length of 5 inches, and working at $f/5$. It was made from the Abbe-Schott glass, and gave splendid results. He showed his results of work done with lens. The "Dresser" shutter was also shown, which could be made to give any exposure.

---

From Jena another novelty is also to be expected soon. The technical institution, where the celebrated optical glasses are made, has offered to make a red normal glass for photographic dark rooms. Considering the fact that, from twenty red lights tested by me lately, I found only a few pieces which admitted the passage of red light only, and that of the other lights there could only be used some very small parts, the furnishing of a pure red glass can be only hailed with pleasure, particularly for the colour sensitive plates, which indiscriminately will all fog under a bad red light. While we have optical glasses in Germany, we are accustomed to get the cheaper glass for plates from Belgium, although the duties are pretty high.—*Dr. Vogel in Anthony's Bulletin.*

Fluorgraphy.—Fluorgraphy is a process of lithography or phototypy (collotypy) transfer to glass, by means of a fluoric ink, which, in contact with fuming sulphuric acid, disengages fluorhydric acid, which acts on the glass. The collotypes are inked with:

| | | |
|---|---|---|
| Soap ... ... ... ... ... | 50 | grammes |
| Glycerine ... ... ... ... | 200 | ,, |
| Talc ... ... ... ... ... | 50 | ,, |
| Water ... ... ... ... ... | 100 | ,, |
| Borax ... ... ... ... ... | 34 | ,, |
| Fluor-spar ... ... ... ... | 90 | ,, |
| Lampblack ... ... ... ... | 15 | ,, |

A negative is transferred to a plate. This is surrounded with a border of wax and covered with sulphuric acid at 64° or 65° Beaumé. After from fifteen to twenty minutes the acid is poured off, the plate washed in abundant water, then cleaned with a solution of potash, and, finally, well washed in water and dried with a rag.—*Wilson's Photographic Magazine.*

## Answers to Correspondents.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

M. A. S.—*Hot Development.* An enamelled iron basin or pie-dish heated over a well-diffused gas flame, such as given by Fletcher's No. 15 standard burner turned quite low, would give you quite as much heat as you require; and the contents of the dish should be frequently agitated, so that the temperature may become tolerably uniform throughout.

M. P. (Redhill).—*Ready Sensitised Papers.* 1. In confirmation of our remark last week to the effect that twelve months was too long a period to keep untainted a stock of ready-sensitised papers, we have just come upon some practical evidences of the fact by finding a small parcel, dated Monday, June 9th, 1890, which has remained in our possession closely wrapped up in non-actinic papers, and put away in a perfectly dark place for that length of time—fourteen months. Upon opening the packet we found the silvered papers blackened round the edges, and considerably stained all over—in fact, perfectly useless. Another parcel from a well-known manufacturer, dated February 14th last, has also become quite brown, although kept only six months in perfect darkness. Tin boxes are said to be the best mode of packing, being both air-tight and light-tight. 2. In answer to your second letter, just received, we may reply that the sensitising bath does *not* easily get out of order, for the citric acid tends to preserve it, but the silver being gradually withdrawn, will require to be compensated by addition of fresh solutions of even increased strength.

F. H.—*Photo-Mechanical Processes.* The best epitome is, perhaps, Mr. W. T. Wilkinson's book entitled, "Photo-Engraving, Photo-Litho, and Collotype" (London: Hampton, Judd, and Co.), or England Brothers. The later processes have not escaped notice in our columns. See page 190 of March 6th for Mr. Warnerke's "Collotype Printing without Machinery"; the News of April 17th and 24th for Sutton's "Process for Producing a Printing Block"; "The Russian Simplified Process," page 360 of May 8th; and the "Hoke Engraving Process," about which you are enquiring, described in the News of May 22nd, with sundry illustrations on pages 387, 417, and 513. The "Sir Paul Pindar" and "Hastings Caves" were, we believe, both reproduced by this process, and are the work of the editor.

L. P. G.—*Rapid Filtration.* A good sample of white filter paper immersed for a few moments in strong nitric acid (sp. gr. 1·42), and then rapidly washed in water, is found to filter both faster and more efficiently than the same paper in its original state. Being thus converted into pyroxylin (nitro-cellulose), it does not reduce chromic acid or silver solutions when filtered through it, and in the event of a precipitate having to be collected and burnt, of course the incineration is more easily accomplished.

Tyro (Burnham).—*Warnerke's Sensitometer.* You will find the instrument figured and described in the News of Oct. 19th, 1888, page 662.

A. B.—*Salts to Silver: Atomic Weights.* Having written out the formulæ:—

$$Ag\,NO_3 + Na\,Cl = Ag\,Cl + Na\,No_3;$$
$$Ag\,No_3 + K\,Br = Ag\,Br + KNO_3.$$

By reference to the table at the end of the Year-Book, the atomic weights are shown to be for NaCl 58·5; KBr, 118·8; $AgNo_3$, 169·5; so that these are the proportions required in order to get absolute results with pure materials. It is usual to employ a slight excess of potassium bromide in making emulsions.

Received: "Justus Von Leibig: an Autobiographical Sketch," translated by Dr. J. Campbell Brown; and "Outlines of a New Atomic Theory," by Dr. T. L. Phipson.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1721.—*August* 28, 1891.

CONTENTS.



## PHOTOGRAPHIC CIRCULARS.

Among the advantages of the past, the "good old times"—which, in one respect at least, deserved their laudatory epithet—was that negative bliss, the absence of discomfort too frequently occasioned in the present by the arrival of the everlasting circular. How often have wild words wandered from the mouth of Jones, who has long languished, expectant of that little cheque, and anxiously attending its arrival by every post, when he discovers—brought to him by the careful postman—now a list of the marvellous cures of a new medicine, and now a description of the advantages to be derived from becoming at once a member of the Company (Limited) for importing asses into Spain! To our ancestors these multiplied copies of exposition of mercantile interest called circulars, as addressed to a circle or number of persons, were happily unknown. Dr. Johnson, in his Dictionary, though in addition to the ordinary meaning of geometrical form, he treats of circular lines and circular sailing, is altogether dumb about the circular, the business circular of modern time.

The photographer who wishes to add to the heap of gold which he keeps at his bankers, it behoves to be wary exceedingly in the composition of circulars. What is the advantage now, in this brazen age of scepticism and incredulity, to chatter about "high finish" or "artistic skill"? Of what profit is it now to prattle in print in the page consecrated to advertisements of the "finest studio" in Stockwell? What boots it to talk of the "best portraits" in our modern Babylon? Of what avail to add that these same portraits are the "most economic" in all England? Or of what service to challenge to competition the world at large? People are no longer like those Bereans, more noble than the Jews of Thessalonica—the Bereans who received the word with all readiness of mind. Incredulity is in the air. We have learned to doubt the genuineness of such circulars, and to distribute them is but to sow the sand, to preach to the wind, to beat the waves, to bay the moon, to whistle a waltz to a milestone. The public is as careless of the "finest studio," the "best portraits," the "cheapest cartes," as the neighbouring rustics were in the old fable of the plaintive voice of the shepherd lad who beguiled his leisure moments by ejaculating "Wolf! wolf! wolf!" when there was no wolf. The public is all too wise to be caught by this venerable bait. Too often have the "best portraits" been weighed in the scale of family censure and been found wanting. Too often has the "finest studio" proved to be a small, ill-lighted, dilapidated, and draughty attic. Circulars conceived in this style serve less to attract than to repel. They have come to be synonymous, to the experienced understanding, of those weird words which Dante imagined written over the portals of Hell. What, then, is wanted in a photographic circular, when such incitements as these have been proved to be insufficient, and even our "own particular process" has been discovered to be totally inadequate to fulfil the design for which its ingenious parent brought it into being? The answer to this question is contained in one word—novelty. Nay, the successful circular must be like the latest comedy, not only new but also original.

The Athenians and strangers which were in Athens in the days of Paul were not, probably, the only people in the world of his period who spent their time in nothing else but either to tell or to hear some new thing. The saint, for his own purpose, singled them out especially, but the desire of novelty is as strong and universal in our metropolis in the time of our most gracious sovereign lady Queen Victoria, as it was in Athens in the days of the heathen Emperor Nero. The yearning avidity for something fresh, which is the chief principle of attraction in the crowd unable to fill its heart with gazing at the *kyrielle* of a street quack, or the gew-gaws used in the coronation of a queen, may be censured by ministers of the Gospel as arguing a worldly, shallow, or unsettled mind; but it is, nevertheless—by reason, perhaps, of our corrupt nature—so strangely prevalent that even these ministers themselves have been known to read, mark, learn, and inwardly digest the story of some ephemeral scandal in the *Daily Telegraph* with far more eagerness, interest, and concern than they show in the varying accounts of the appearances after the Resurrection, as given by the four evangelists of the New Testament. Nay, according to the witness of one of themselves, uttered with but little charity and, it is to be hoped, with still less truth, these "persons, forgetful not only of their calling, but of the very spirit of the Gospel, read the account of a battle with the most violent emotions; and, provided the victory falls to their favourite side, they exalt and triumph in proportion to the number of thousands that have been slain."

The advertisement which contains the element of the novel, the strange, the unexpected, is the advertisement which pays. Arrangements should be made artistically to excite curiosity and surprise. This is not easily managed, but it may be done; and if a *soupçon* of the comic is added to the mixture by some photographic Busch or Cruikshank, that is all that is required for a first-class and effective advertisement.

Some of the circulars of the past were in a high degree meritorious, and obtained, doubtless, for their inventors that fame and profit which was the end of their production. Many years ago a crafty gentleman, well aware that the liberal mind of the public is distinguished by nothing more than a large amount of curiosity, scattered abroad, on what he held to be suitable soil, certain seeds in the form of circulars full of the merits of novel pictures, which he called "winking photographs." This mysterious advertisement, with its weird and uncanny title, held the careless reader as securely as the ancient mariner with his glittering eye held the hurrying wedding guest.

But the photographs turned out to be a very ordinary device after all. Two negatives were taken of the same person; if a person conspicuous for extreme ugliness or extreme beauty, so much the better for the advertiser. One of these negatives was taken with the eyes open, the other with the eyes closed. They were fastened on opposite sides of a piece of transparent paper, and applied so as to correspond exactly, as Euclid says, each to each. The double picture thus formed, when held before any light of uncertain intensity—say, for instance, one of the lamps provided for the discipline, by its capricious flicker, of the patience of persons disposed to read on the Underground Railway—produced, by the combination of its negatives, the strange effect of a deliberate wink. A photographic circular which, in its bold originality, deserved if it did not meet reward, consisted of a card with the photographer's name and address, and nothing more; but then there was this peculiarity—it is a peculiarity no longer now—the whole legend was set diagonally. It did what every circular should do; it compelled attention. Like the mask of the highwayman, it remained imprinted on the tablets of the mind, and the address of that enterprising photographer was as little likely to be forgotten as the "Stand and deliver!" by him who had once heard these words of evil omen. The very conciseness of this photographer's story added to its effect. It avoided all expression of political or religious opinion; it appealed to no prejudices; it flattered no vices; it was not puffed up; it praised not its own wares; it offered quality for quantity; it produced no fatigue.

Persistence of vision has brought about some interesting photographic circulars. They are, perhaps, almost too well known to need description; but, for the information of such as have not seen them, it may be said that they consisted of two circular spots, one red, the other white. Underneath were directions to gaze on the red spot for some twenty seconds, and then turn the eyes upon the white, which would at once appear to be coloured with green. This blend of photography with optics depended, of course, for its effect on the simple law of complementary colour. But where does the advertisement come in? In the centre of the red spot. There, printed legibly in white, stood out the name and address of the craving artist, and this name was declared by the advertiser to be equally visible, though not equally existent, on both spots. Some excellent persons, whose vision was possibly of an exceptional order, were found unable to discover these marvels. It may be that they were professional rivals, and that the foul fiend of jealousy bleared their eyeballs. Anyhow, the public was solemnly assured that there was no trickery or fraud or vain conceit of any kind in the circular, and that the phenomena would be as stated to the normal sight. No idle jest was this advertisement, like that illusion attributed to Mr. Toole in the matter of the slimy dungeon. The comedian is said to have produced an empty box, in which, he averred, such dungeon was situated and clearly visible. People gazed expectant into this box, but no slimy dungeon was discoverable. "Then," said the comedian, airily, "if you cannot behold the dungeon, this much at least is clear, that the box contains a perfect cell!"

Brown had a fine high time of it with his coupons. He agreed to take a dozen portraits of the bearer of a coupon for half-a-crown. The coupon was only available for one month from date. This last touch did the business. People came in flocks to Brown's studio, and there was Brown hard at work, exposing, developing, and what-not, from dewy morn to dusky eve, and picking up gold and silver, as it were, from a veritable Tom Tiddler's ground. But in due course this trick of the coupons became stale, and, therefore, unprofitable.

Robinson still makes a pretty penny out of his portraits of celebrities advertised by his circular. The celebrities will commonly sit for the asking; if not, why, as Sir Horace Walpole was wont to observe, "Every man has his price"—an observation which may be equally true of woman. And celebrities never fail. In London there is the latest murderer, the fashionable ballet-girl, or the newly consecrated bishop; in small hamlets there are the local parsons, who little think—good, honest men—that they are helping a trade advertisement, or the editors of the local newspapers. Pictures of the former secure nine-tenths of the female flock, and pictures of the latter are well paid for by "pars" about a certain accomplished artist and his admirably arranged studio.

Circulars displaying phosphorescent photographs, or pictures of people luminous in the dark—people who have never been known to shine, like the above-mentioned celebrities, in the light—have doubtless had their day, and equally without doubt produced a comfortable income for their originators.

Circulars arousing interest by their crafty commencement are not, perhaps, far distant from a photographic fraud. They begin by setting forth the advantages, mental and bodily, of a trip (say) to Rosherville, and conclude with the delight and profit of taking a snap-shot at everything on the way by the "Rattlesnake" camera, only to be procured of the sole manufacturers and patentees, &c. Photographic circulars of this nature are already too numerous; but it is difficult to refrain from mentioning expressly the device of an ingenious gentleman who sold several pictures of a crowned head by the following announcement:—"On the 18th inst., about twelve hours before midnight, a man was seen to level a double-barrelled camera at His Majesty, who, finding all resistance in vain, at once surrendered, and was borne in triumph to ——, where he is now on sale in the shape of an exquisitely mounted carte at eighteenpence the dozen."

Though originality is pleasing in a circular, originality in some of its multiform varieties is hardly likely to effect its purpose of a ready sale. Of such a kind was the originality in a circular which cautioned mothers not to bring their young children—called, somewhat impolitely and contemptuously, "brats," though this word is used, certainly with no want of respect, by the old poet Gascoigne:—

"O Israel! O household of the Lord!
O Abraham's brats! O blood of blessed seed!"

as pictures of the said brats would on no account be taken. Of such a kind was the originality of a document which adjured ladies not to come for their portraits with their back hair done in the present hideous fashion. Of such a kind was the originality, dictated not by the charity which thinketh no evil, advising the public not to be misled by the specious pretensions of a rival who had "hired for a studio a second-hand stable."

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Transferring Albumen Prints to Wood, Metal, &c.—Orthochromatic Collodio-Bromide Emulsion—Increasing the Sensitiveness of Asphaltum.

*To Transfer Ordinary Albumen Prints to Wood, Metal, Glass, or Porcelain,* it is, according to *Photographie,* sufficient to thoroughly clean the surface to which the image is to be transferred, if it is a polished or a glossy one, and to smooth it if it is a rough one. It is then coated with a thin layer of copal varnish, and the toned and fixed albumen print is placed upon it whilst still wet. All the air-bubbles and the excessive varnish should be pressed out by means of a squeegee or an india-rubber roller, and then the whole allowed to dry for about four hours. After this time the back of the print is moistened by means of a sponge, when it may be lifted off its support, whilst the albumen film, together with the picture, remains on it. The image is then coated once more with copal varnish in order to protect it and to render it more brilliant. A reversed transfer is obtained in this way. If, however, gelatine negatives which can be stripped from their glass support, or transparent films, are used, a reversed print may be made on albumen paper, and this one transferred in the manner described above.

*Orthochromatic Collodio-Bromide Emulsion.*—At the suggestion of Professor Eder, Dr. A. Jonas has worked out a method for making orthochromatic collodio-bromide emulsion similar to that introduced some years ago by Dr. E. Albert. The results of this important work have been published by Dr. Jonas *in extenso* in No. 370 of the *Photo. Correspondenz.* The following two solutions are prepared:

*Solution No.* I.

| | |
|---|---|
| Bromide of ammonium ... ... | 64 grammes |
| Distilled water ... ... ... | 80 c.c. |
| Alcohol (absolute) ... ... ... | 800 ,, |
| Thick 4 per cent. collodion... ... | 1,500 ,, |
| Acetic acid ... ... ... ... | 65 grammes |

*Solution No.* II.

| | |
|---|---|
| Nitrate of silver (crystal) ... ... | 80 grammes |
| Distilled water ... ... ... | 50 c.c. |

The silver nitrate is dissolved by heat, and an aqueous concentrated solution of ammonia (spec. grav. 0·91) is carefully added in small portions, until the brown precipitate first formed is again just dissolved. About 75 c.c. of ammonia will be required for this purpose. Finally, 800 c.c. of warm alcohol (113° F.) are added. Both solutions may be prepared by daylight. In the dark room, which should be illuminated by orange light, solution No. II. is poured into solution No. I. in a thin stream, shaking violently all the time. The temperature of solution No. II. should be kept at from 104° to 122° F., because otherwise ammonio-nitrate of silver will crystallise out. A drop of the emulsion thus prepared is then brought into contact with litmus paper, and if it be alkaline, acetic acid should be added drop by drop until the emulsion gives a slightly acid reaction. It is then shaken for a quarter of an hour, allowed to stand for an hour, and then poured into five or six times the quantity of water. The precipitated emulsion is collected on a clean linen cloth, and the latter hung in running water for one or two hours. Finally, the superfluous water is gently pressed out, the emulsion washed several times with distilled water, pressed out once more, and spread out on thick blotting-paper to dry. For use, dissolve—

| | |
|---|---|
| Dry collodio-bromide ... ... ... | 6 grammes |
| Alcohol ... ... ... ... | 40 c.c. |
| Ether ... ... ... ... ... | 60 ,, |

To render the emulsion colour-sensitive, a certain quantity of picrate of ammonia and glycerine, and the solution of the dye, is added to it. In the case of cyanin, the following mixture should be prepared:—

| | |
|---|---|
| Collodio-bromide emulsion ... ... | 100 c.c. |
| Solution of cyanin, 1 : 150 ... ... | 10 ,, |
| Glycerine ... ... ... ... | 1 ,, |

The action of excess of silver nitrate in the dyed emulsion is very remarkable also in the collodion process. If 51 milligrammes of silver nitrate are added to each 100 c.c. of the emulsion, the sensitiveness of it will be increased at least two times. To obtain a highly colour-sensitive emulsion dyed with eoside of silver, proceed as follows. A raw emulsion is at first prepared by dissolving 6 c.c. of collodio-bromide in 40 c.c. of absolute alcohol and 66 c.c.

of ether by frequent agitation. Then the following three solutions are prepared :—

*Solution No.* I.

| | |
|---|---|
| Crystallised eosin ... ... ... | 4 grammes |
| Distilled water ... ... ... | 50 c.c. |
| Alcohol (96 per cent.)... ... ... | 450 ,, |

*Solution No.* II.

| | |
|---|---|
| Silver nitrate ... ... ... ... | 3·4 grammes |
| Distilled water ... ... ... | 50 c.c. |
| Alcohol (96 per cent.)... ... ... | 150 ,, |

Ammonia, concentrated solution, until the first formed precipitate is again dissolved.

*Solution No.* III.

| | |
|---|---|
| Picric acid ... ... ... ... | 3 grammes |
| Distilled water ... ... ... | 10 c.c. |
| Ammonia to neutralise the solution | |
| Alcohol (96 per cent.) up to ... ... | 300 c.c. |

Just before use, mix—

| | |
|---|---|
| Solution No. I. ... ... ... | 75 c.c. |
| Solution No. II. ... ... ... | 30 ,, |
| Solution No. III. ... ... ... | 30 ,, |
| Glycerine, chem. pure... ... ... | 20 ,, |
| Alcohol (96 per cent.)... ... ... | 45 ,, |

This eoside of silver solution is allowed to stand for one or two days and filtered, and 20 c.c. of it are mixed with each 100 c.c. of the raw emulsion. This dyed emulsiou requires only about one-third of the exposure of wet collodion, but it keeps ouly one or two days. The glass plates, before being coated with the emulsion, are provided with the following substratum: 5 grammes of white gelatine are dissolved in 500 c.c. of distilled water, and to this solution are added 15 c.c. of acetic acid and 10 c.c. of alcohol. The solution is filtered at a temperature of 100° to 110° F., and, whilst still warm, poured twice upon the plate. After being coated with emulsion, the plates are placed directly, without washing, into the dark slide, and can be at once exposed; they will, however, keep damp for thirty to forty minutes iu not too hot a room. When exposed, the plates are washed by dark red light until all greasiness has disappeared, and allowed to drain in an upright position for some time. This draining must continue the longer the larger the plates are ; if they are not sufficiently drained, streaks will be produced on the film during development. Development takes place by copiously pouring the developer over the plate, as in the case of the wet collodion process. The following concentrated hydroquinone developer is recommended as the best for this purpose :—

*Solution* A.

| | |
|---|---|
| Distilled water ... ... ... | 500 c.c. |
| Sodium sulphite ... ... ... | 200 grammes |
| Potash ... ... ... ... | 200 ,, |

*Solution* B.

| | |
|---|---|
| Hydroquinone ... ... ... | 25 grammes |
| Alcohol (96 per cent.) ... ... | 100 c.c. |

*Solution* C.

| | |
|---|---|
| Bromide of ammonium ... ... | 25 grammes |
| Distilled water ... ... ... | 100 c.c. |

The concentrated developing solution consists of—

| | |
|---|---|
| Solution A ... ... ... ... | 100 c.c. |
| Solution B ... ... ... ... | 5 ,, |
| Solution C ... ... ... ... | 7 ,, |

In the case of hard negatives, solutiou B is increased to from 6 to 7 c.c. The actual developer is prepared by mixing—

| | |
|---|---|
| Concentrated developer ... ... | 150 c.c. |
| Water ... ... ... ... | 1,000 ,, |

The plates can be intensified with pyrogallic acid and silver by preparing the following two solutions :—

*Solution* A.

| | |
|---|---|
| Pyrogallic acid ... ... ... | 7 grammes |
| Citric acid ... ... ... ... | 7 ,, |
| Distilled water ... ... ... | 1,500 c.c. |

When dissolved, add—

| | |
|---|---|
| Acetic acid ... ... ... ... | 25 drops |

*Solution* B.

| | |
|---|---|
| Nitrate of silver ... ... ... | 10 grammes |
| Distilled water ... ... ... | 100 c.c. |

Just before use, 100 c.c. of solution A are mixed with 5 c.c. of solution B. If it is desired to intensify the plates after fixing, the same pyro and silver intensifier may be used, but the hydroquinone and silver intensifier also answers very well. For reducing the negatives, the hypo and ferricyanide of potassium reducer, as used for gelatine plates, may be used.

*Increasing the Sensitiveness of Asphaltum.*—E. Valenta has found that the sensitiveness of asphaltum may be materially increased if it is incorporated with sulphur. He dissolves from 7 to 10 grammes of sulphur in a sufficient quantity of bi-sulphuret of carbon, and adds 100 grammes of Syrian asphaltum. The solution is then freed from the bi-sulpuret of carbon, and for about one hour heated up to 100° C. ; it is then transferred to an air-bath, and gradually heated up to about 180° C., until sulphuretted hydrogen is escaping. At this temperature it is kept for about five hours. The asphaltum forms, after this treatment, a black and shining mass, which does not dissolve in alcohol, and only to a small degree in ether, whilst it dissolves perfectly in turpentine, benzole, chloroform, and bi-sulphide of carbon. Four parts of this preparation are then dissolved in 100 parts of benzole, and the solution is applied in the usual manner to a polished zinc plate. It forms a light yellow, thin film of comparatively high sensitiveness to light, and gives, therefore, beneath a negative of good density clear and sharp impressions after the development with turpentine, even with comparatively short exposures.

## THE DECOMPOSITION OF SILVER CHLORIDE BY LIGHT.*

BY A. RICHARDSON, PH.D.

It is known that the presence of hydrochloric acid exercisesa retarding influence on the decomposition of chlorine-water by light, aud a series of experiments have been made (*B. A. Report*, 1888) in order to determine the influence of different quantities of acid ou its stability. The results given in Table II. show that even minute quantities of the acid exercise a very decided influence on the rate at which free chlorine is converted into hydrochloric acid under the influence of sunlight (exposure seven days, August 17—24).

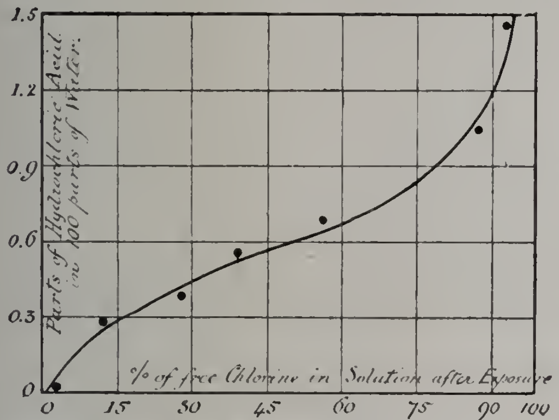
Table II.

| Parts of Cl per 100 $H_2O$. | Parts of HCl per 100 $H_2O$ added. | Per cent. free Cl found. | Per cent. combined Cl found—HCl added. |
|---|---|---|---|
| 0·284 | 0·029 | 2·34 | 97·66 |
| 0·270 | 0·289 | 12·61 | 87·38 |
| 0·260 | 0·400 | 28·57 | 71·42 |
| 0·290 | 0·587 | 39·25 | 60·95 |
| 0·290 | 0·724 | 58·71 | 41·29 |
| 0·282 | 1·158 | 87·82 | 12·18 |
| 0·291 | 1·447 | 95·47 | 4·53 |

Iu the case of silver chloride in water, the chlorine evolved during exposure to light is at first speedily con-

* Continued from page 597.

verted into hydrochloric acid, but as the strength of acid increases its rate of formation diminishes. Free chlorine, therefore, accumulates in the solution until (the intensity of light remaining constant) a maximum is reached, at which stage further decomposition of silver chloride is balanced by recombination of chlorine with the darkened product. The formation of free chlorine is still more marked where silver chloride is exposed under a solution of hydrochloric acid in the first instance, as is shown by the following experiment, in which equal quantities of silver chloride were exposed to light in solutions of hydrochloric acid of varying strengths. After an exposure of seven days (April 20—27) the free chlorine and oxygen liberated were determined. During exposure it was observed that the liquid in the tubes containing acid was of a distinctly green tint (especially when seen through




the entire length of the tube), the chlorine liberated from the silver salt remaining in solution in the water. In the night, however, rechlorination of the darkened silver compound had occurred to such an extent that the colour had almost entirely disappeared from the solution. The estimation of the free chlorine was therefore made immediately after exposure to bright sunshine, and again after the liquid had been left in contact with the darkened product for fourteen hours in the dark.

The results obtained are given in the following table:—

Table III.

| 1. HCl added per 100 c.c. solution. | 2. c.c. O set free. | 3. Free Cl found. | 4. Free Cl found after 14 hours in the dark. |
|---|---|---|---|
| 4·0 | minute bubble | 0·042 | 0·014 |
| 1·97 | 0·5 | 0·035 | 0·019 |
| 0·38 | 1·9 | 0·024 | 0·003 |
| 0·19 | 1·7 | 0·007 | 0·0008 |
| 0·00 | 4·2 | 0 0017 | 0·0003 |

In another experiment, made to determine how far the total amount of chlorine evolved from silver chloride during exposure was influenced by the presence of hydrochloric acid, the following results were obtained. A comparative experiment was made with silver chloride in pure water:—

Table IV.

| HCl per 100 pts. $H_2O$ taken. | Total Cl found (—HCl added). | Combined Cl found. | Free Cl found. | Per cent. free Cl. |
|---|---|---|---|---|
| 0·909 gram | 0·201 gram | 0·173 | 0·027 | 13·7 |
| 0·0 ,, | 0·276 ,, | 0·273 | 0·002 | 0·94 |

Here it is seen that, although the presence of hydrochloric acid increases the amount of free chlorine in the solution, yet the total chlorine set free—and, therefore, the amount of decomposition of the silver salt—is decreased. In order, then, to obtain the maximum amount of surface decomposition of silver chloride, it is necessary that the volume of water present should be relatively large, and that the solution of acid formed should be often replaced by pure water during the exposure.

The explanation of the retarding influence of haloïd salts and of oxidising agents on the darkening of silver chloride appears to be found in a study of the action of these substances on solutions of chlorine-water under the influence of light.

The condition of the free chlorine in the solution is one of some interest, and was next studied. The examination of the liquid for oxy-acids of chlorine was, however, hampered by the fact that a part of the oxygen liberated was present as ozone, the smell of this substance being distinctly recognised, especially during the first periods of exposure of silver chloride, when large quantities of water were present. To further prove the presence of this substance, air was drawn through water containing silver chloride in suspension during exposure to sunlight, and was then passed through two bulbs containing solutions of silver nitrate, and finally into a solution of potassium iodide which was protected from the light; the liquid in the first bulb became milky, that in the second remained perfectly clear, whilst iodine was set free in the solution of potassium iodide. No hydrogen peroxide was detected in the liquid containing silver chloride during any period of exposure.

The observations of Popper (*Annalen*, 227, 161) and of Pedler (Trans., 1890, 57, 613) show that hypochlorous and other oxy-acids of chlorine are formed during the decomposition of solutions of chlorine-water by light, and it seemed probable that a part of the chlorine evolved by the decomposition of silver chloride by light should, in presence of water, form similar products, and statements to this effect have repeatedly been made (*B. A. Report*, 1859, 107). An experiment was, therefore, made in which silver chloride, in contact with a small quantity of water (20 c.c.), was exposed to bright sunlight for six hours. The liquid was then tested for hypochlorous acid by agitation with mercury, and subsequent treatment with hydrochloric acid, as suggested by Wolters (*J. pr. Chem.*, 74, 68). The formation of hypochlorous acid was noted by the fact that mercury was present in the solution. Although this test could not be applied quantitatively in the presence of ozone, yet the comparatively large quantity of mercury in the solution could only be ascribed to the presence of hypochlorous or similar acids in the liquid, together with free chlorine. It was noticed, however, that a strong solution of hypochlorous acid was decomposed by contact with normal silver chloride, even in the dark, a green gas containing free oxygen and chlorine being evolved; the silver chloride appeared to be unaltered. How far dilute solutions of the acid are decomposed is yet to be determined.

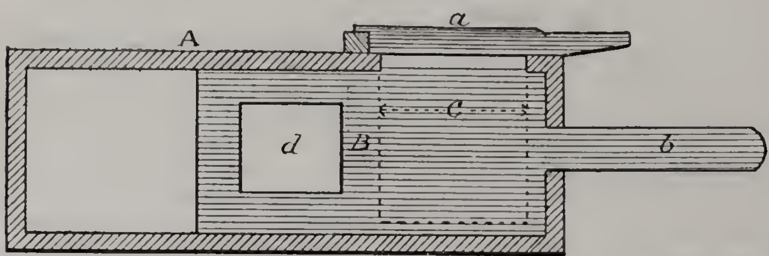
*(To be continued).*

We clip the following note regarding Mr. Robinson's pictures at the recent Buffalo Convention from *The Express* (New York):—"Strolling about the gallery, one is attracted by many handsome pictures. Mr. H. P. Robinson, considered the peer of landscape artists with the camera, makes a splendid exhibit, which never tires the eye. Sunlight and shadow are blended so perfectly that it is not difficult for the spectator to imagine himself surrounded by the charms of a summer idyl."

## PHOTOGRAPHING THE THROAT.

BY DR. MUSEHOLD, BERLIN.

In my experiments in attempting to produce a serviceable photographic picture of the throat, I started, in the first place (in the early part of 1890), with the idea of inserting a photographic apparatus between the mirror which is lighting the throat, and the eye of the researcher, in order to observe the throat picture on a focussing-screen just as it is seen by means of a laryngoscope. It is known that in previous experiments of this kind the results have been hardly satisfactory. This is shown by the last meritorious communication of Dr. Wagner (*Berlin Klin. Weekly Gazette*, 1890, No. 50); and the same failure had been already distinctly mentioned, and with justice, by Dr. Riesenfeld (*Photographic News*, Berlin, 1891, March, Part I). In my apparatus (which I constructed for the purpose), as soon as the picture of the throat thrown on to the ground glass shows the necessary sharpness and the desired position for photographing, the sensitive plate is rapidly made to take the place of the focussing-screen, and then the picture is taken by means of a magnesium flash-light. The changing of plates takes place by the help of the petroleum or gas light used in laryngoscoping, while the magnesium flash-light (Dr. Meithe) is so fastened on to the arm which joins the reflector and its lamp that the magnesium light, when produced, and the lamp flame are nearly concentric.




Half size of case. Back wall has been removed.

A. Case. *a*. Slit closed by a shutter. B. Back of slide. *b*. Bar for moving. *c*. Place for sensitive plates. *d*. Ground glass fastened on to front side.

The camera with the reflector, which is held by the universal jointed arm of Tobodd's laryngoscope, is fastened to the base of an ordinary strong head-rest by means of a screw, so that an approach to the object and a horizontal movement is possible. The apparatus permits in this way of being placed between the patient and the physician without trouble. As lens, I have hitherto used (in order to obtain pictures as large as possible), first a Hartnack-Anastigmat of 11 cm. focal distance and 11 mm. aperture, and latterly a Steinheil-Antiplanet of 12·5 cm. focal distance and 21 mm. aperture. The reflector is the one customarily used in laryngoscoping, of about 20 cm. focal distance, and with a central hole of 20 mm. The principal part of this on the whole very simple apparatus is the case. While at other times the lens is found in the camera, I have for this above-mentioned purpose placed it in the case. The latter is erected for plates 4 by 4 cm. in size, and consists of a box which is 15·5 cm. in length, 5 cm. in breadth, and 1·5 cm. in thickness; it has an opening 3 by 3 cm. in diameter in the centre of each of its sides. One of these openings, namely, that in the front side of case, has around it a ledge with sloping inner edges; this is to form a groove for corresponding ledges, which are arranged dove-tail fashion round a central opening of the same size in the back wall of the camera, which remains shut.

In the inside of the case is a slide, occupying its whole breadth, but only two-thirds of its length, which consists essentially of a board, with a bar fastened on the side. The latter projects 5·5 cm. from the right-hand short side of the case, according to the position which the case takes on the camera.

In this position the slide fills up the two-thirds of the case lying to the right. The left half has an opening measuring 3 by 3 cm., which, in the just mentioned position, therefore, is concentric with the two openings of the case, by reason of the handle being drawn out. This opening in the slide towards the front—that is, towards the camera—is covered with a ground glass; the right half of the slide has, on the front side, a support closed at the sides and underneath by ledges, and open at the top, which serves for the reception of the photographic plate. The sliding board which forms the back wall of the support, and also the velvet straps which are laid on the edges of it, prevent the plate being exposed to unnecessary light. The latter is pushed into the support through a closable slit, which is in the upper narrow long side, and which is made light-proof by means of a shutter.

As soon as the picture is clearly projected on the ground glass, the slide is pushed, by means of the bar or handle, to the left to the end of the case, and consequently moves the sensitive plate, which is on the same level, behind the front opening of the case—that is, where the ground glass was standing before. The same hand which pushes the slide immediately turns on the flash-light, and pulls the slide back again to the right by the handle, which still sticks out. The light which falls on the sensitive plate from the gas or petroleum flame during the pushing backwards and forwards of the slide has no influence on the sharpness of the picture; this has been proved with this case by some very successful portraits of children. After the operation is finished, the case must be taken into the dark room, and the plate removed and developed.

Naturally, the photograph can be done only in a room from which the daylight is quite excluded, or in the evening. But this disadvantage can be set aside by placing an instantaneous shutter on the slide itself in front of the sensitive plate, which should be put in motion as soon as the slide has been pushed right up to the other side of the case. Then, with the help of a magnesium light, the photographing can take place at any time of day.

The results at which I have arrived at hitherto are certainly encouraging to the continuance of experiments in this line. The size of the picture of the throat is from $\frac{4}{5}$ to $\frac{5}{6}$ of the natural size.

Although my experiments are not yet terminated, I have thought it advisable to describe the above arrangement, and especially the case, in order to facilitate the troublesome work to all those who occupy themselves with this subject, or to stimulate them a little to successful improvements of the simple apparatus described.

I hope before a very long time to be able to go more deeply into this subject in these columns.—Abstracted and translated from *Photographisches Wochenblatt*.

## SUNSPOTS.

The following interesting notes are extracted from a letter by Sir Robert Ball, Astronomer-Royal for Ireland, which recently appeared in the *Daily Graphic*:—

First let me say that no extensive or elaborate apparatus is necessary for the simple observations that I am suggesting: any fairly good telescope will answer for the purpose. I daresay this paper will be read by many who are enjoying their seaside holiday, and the same telescope that is used for observing a yacht race will often be quite sufficient for observing the sun. Of course, the eye must be protected by the interposition of a piece of dark glass, or in some other manner. If a convenient arrangement for this be not at hand, then a sheet of white paper held near the eyepiece can be so placed as to receive a picture of the sun, whereupon the interesting features on the surface of the great luminary that are now attracting so much attention will be distinctly visible. At the present time it happens that the sun is diversified with an exceptionally large number of spots; in fact, it seems that the number and extent of the spots has been largely augmented during the last six months, nor does it yet appear to have reached its maximum. This increase has not been, however, quite uniform. The surface covered by spots in February was in excess of that in January. There was, however, a falling-off in March; but in both April and May the area covered was about double that in January, while in June the spotted regions were nearly three times as great as at the beginning of the year. Anyone who is desirous of seeing the exact figures may refer to the current number of *Nature*, where will be found the particulars of an interesting series of observations made by M. Marchand, at Lyons Observatory, during the first six months of this year. It appears that since the end of March not a single day has passed without a spot having been visible on the sun. There are also indications of activity exhibited by the brilliant solar objects known as faculæ. Indeed, the area of the sun's surface covered by faculæ during the first six months of the present year was in excess of the total amount of faculæ seen in 1890. These circumstances will naturally lead to an increased amount of attention being devoted to the sun during the autumnal months.

The sunspots are well known to be openings through the glowing luminous exterior by which the somewhat darker interior is exposed. The aspect of the spots is constantly changing. This is partly due to the circumstance that the sun is turning round on its axis, so that the objects now visible on that side of the sun which is directed towards us will, in a fortnight, have passed to the other side of the luminary, and will again have returned to the same position from which they were first observed after the lapse of about twenty-five days. But this is on the supposition that the spots last as long as twenty-five days, and such is not always the case. Sometimes a group of spots will only live for a few days; generally, however, they last for a month or two, and in exceptional instances they endure for a year, or even longer. The rapid changes which these objects undergo become all the more significant when we bear in mind the enormous dimensions that are concerned. There are spots so large that the whole earth would not be too great to pass through the opening which they indicate. By far the most interesting point in connection with sunspots is that of their periodicity. It is now about fifty years since the patient observer, Schwabe, announced his important discovery. He had for forty-three years diligently studied the face of the sun, and recorded the spots which it presented. At first he seems merely to have aimed at patiently obtaining a record of celestial phenomena. He never could have foreseen the interesting result that he was to obtain when his long and patiently accumulated series of observations came to be discussed. They pointed, however, to a distinct recurrence of a maximum exhibition of sunspots at every period of about eleven years. These maxima are, however, not a little irregular both as to the time of their occurrences and the amount of the solar disturbance that they indicate. The last sunspot maximum occurred about 1883; but this was somewhat later than was expected, so that it seems as if we were now again approaching a sunspot maximum.

There is, however, a wide distinction between the predictions as to the recurrence of sunspots, and the prediction of ordinary astronomical phenomena, such as eclipses or the like. The latter we can foretell with absolute certainty, inasmuch as the causes which produce them are known to us; but with respect to the sunspot cycle of eleven years, all we can say is that we may expect it to continue because it has been observed in the past, but we know not the reason why. It might naturally be expected that changes in the sunspots should affect in some way the power of the sun for radiating heat, and thus influence the weather. He would indeed be rash who asserted that there was no connection of this nature. It is, however, certain that we have not yet, at all events, been able to trace the slightest connection between sunspots and the practical consideration of weather changes. Many attempts have, however, been made, and some have even gone so far as to search for a relation between sunspots and the price of wheat. It is impossible to trace any reliable connection of this kind, nor have the attempts to identify commercial crises with periods of sunspot maxima proved more successful. If any relation could be ascertained between sunspots and such terrestrial phenomena there would be every possible inducement to discover it. These have been happily suggested by Prof. S. P. Langley (of the Smithsonian Institution) in a passage with which I conclude this letter:—

"Would it be of any practical interest to a merchant in bread stuffs to have private information of a reliable character that crops the world over would be fine in 1888 and fail in 1894? The exclusive possession of such knowledge might plainly bring 'wealth beyond the dreams of avarice' to the user; or, to ascend from the lower ground of personal interest to the higher aims of philanthropy and science, could we predict the harvests, we should be armed with a knowledge that might provide against coming years of famine, and make life distinctly happier and easier to hundreds of millions of toilers on the earth's surface."

This may be possible in the future; but we seem a long way from it as yet.

---

We understand that Messrs. George Houghton & Son's portable tent studios are meeting with favourable comments in many quarters. One of these has been in use by Messrs. Barrauds for the past few weeks, first during the cricket week at Canterbury, and afterwards at Burlington House in connection with the Hygienic Congress there. This tent has been used at both places for taking many hundreds of portraits for composition pictures, illustrative of both events. As an instance of the portability of the apparatus, it may be mentioned that the tent was in use up to four o'clock on Friday at Canterbury, but was in working order in London at noon on Saturday.

## Notes.

We learn that there is every prospect of the coming exhibition by the parent society at Pall Mall proving a success. The demand for entry forms is three times as great as usual, and already a large number of these have been duly filled up and returned to the secretary. We may, therefore, reasonably look forward to an improvement in the standard of works exhibited, for it is evident that the hanging committee will have more pictures than they want, and will be in a position to pick and choose. We also learn that the Affiliation Scheme is gaining support, many of the provincial societies, including some of the largest, having signified their intention of joining it.

Photographers know well how nervousness, or self-consciousness, or some other quality ending in "ness," will make many of their clients assume an expression which, to the beholder, might suggest a visit to the dentist's, if not to the scaffold; and various are the methods by which they will endeavour to counteract this tendency on the part of their customers. "Now please look pleasant!" is a very common, though rather ineffectual, appeal, for when persons are commanded to smile, the attempt to obey is generally productive of a rather ghastly result. It is akin to requesting a humourist to say something funny. Perhaps the most original formula for bringing a nervous sitter to his senses is that which was lately recorded at the Convention in Buffalo, as a specimen of photographic procedure in the old days out West. The photographer of whom the story is told simply levelled a pistol at his client and said, "Look right square in the muzzle o' this yer revolver, my man, and remember that I hain't agoin' to hev this picture spoiled with any o' your foolin'!"

The unfortunate shareholders in the Automatic Photograph Company have suffered so severely that probably no one among them will again invest in any photographic concern on the strength of what they read in non-technical journals. It seems curious that, although there are so many photographic journals, it struck none of these shareholders to ask one of them the question whether this company was likely to fulfil its wonderful promises before they contributed their money to it. The general public is ready to swallow any statements with regard to the possibilities which may be achieved by either photography or electricity, and they are even gullible enough to believe in perpetual motion; but they do not care to take the simple precaution of seeking the advice of those who know more than themselves before investing their money.

It is doubtful whether the question of automatic photography will be revived for some time to come, simply because of the impossibility of getting persons to subscribe to a scheme which has already proved to be abortive; but if it ever be again attempted, it must be on fresh lines altogether. As we have already had occasion to point out, the machines are wonderfully ingenious, but, except under certain conditions, cannot fairly be described as automatic. Skilled attention is constantly necessary; but even with this attention, such machines cannot, from their very nature, be made to work for more than a very limited time, unless their customers are content to receive such terrible things as they have lately been doing.

But the work can easily be put to experimental proof if we attempt to produce a few pictures under the same conditions as these machines work. Take three basins. In No. 1 place the developing solution, in No. 2 the fixing bath, and let No. 3 contain clean water. Now take a photograph in the ordinary manner in the camera, and dip the plate for twelve seconds in each of these basins in their numerical order. Supposing that the light and time of exposure are in harmony, we may get a passable result at first, but what manner of chemical solutions must these be which will stand the constant admixture which must take place through the same unwashed hand or plate-holder dipping into them for successive pictures? No practical photographer would look for anything but failure under such conditions, and failure must be still more certain when unskilled labour comes in to complicate matters.

In an interesting article on Mr. Muybridge's later work, *La Nature* draws attention to his astonishing industry. The American photographer has now accumulated no less than 781 series of instantaneous studies, comprising more than 20,000 photographs. When Mr. Muybridge started in 1878 his ambition was very modest; but he soon became convinced that with improved appliances the work was almost without limit, and so, indeed, it has proved. The expense, however, was at first a great obstacle, and, but for the assistance rendered by the Pennsylvania University, might have been insurmountable. The 20,000 photographs alluded to comprise pictures of men, women, children, animals, and birds, walking, galloping, flying, working, dancing, &c. All these photographs are reproduced in photogravure without any retouching, and form an altogether unapproachable and unique work. *La Nature* gives four reproductions of different studies—viz., the jumping of a horse over a hedge, the walk of the monkey, that of the elephant, and of the movements of a child picking up her doll. The exposures were a thousandth part of a second.

*Apropos* of what may be called the science of instantaneous photography, the latest application is that of M. Demeney, an assistant of Mr. Muybridge's rival in France, M. Marey. M. Demeney has recorded, by means of the camera, the movements of the lips in speaking, and the results are said to be very curious. One captious critic remarks that "*Ich liebe Dich*" looks like a masticating process, while "*Io t'amo*" is suggestive of a desire on the part of the singer to swallow his beloved one. If singers who make grimaces when vocalising were subjected to this minute photographic process, we should fancy they would be effectually cured.

Manufacturers of the better kinds of sensitised papers are frequently handicapped by the difficulty of obtaining English paper equal to that made in Germany, when the supply of the German make falls short, as it sometimes does. As the "Paper Makers' Directory of all Nations" remarks, Germany leads the world in the making of paper, and it is a very interesting question to know why. There are 1,443 paper mills as against 270 in England and Wales, and 68 in Scotland; while in the matter of the very best qualities the German market is supreme. One would think that England should be able to hold its own, but it does not appear to be so.

## PHOTOGRAPHY AND THE BRITISH ASSOCIATION.

Photography continues to assert itself in many of the papers read before the British Association at Cardiff in such a marked manner that it would almost seem as if the president's address had given others the cue to give the art recognition. First of all, in connection with the Geological Section, a large number of photographs were displayed in an adjoining class-room, and the second report of the committee appointed to arrange for their collection, preservation, and registration was submitted by Mr. O. W. Jeffs. The report showed that during the past year the work of collecting photographs illustrating the geological features of the country had been continued, with the result that 278 additional photographs had been received and registered, making a total up to the month of July of 552. At the Leeds meeting of the Association upwards of 200 photographs were arranged for exhibition in the room appointed for the use of Section C, many of which illustrated sections of strata and other geological features of considerable scientific interest. The collection attracted much attention; and it was proposed to continue the exhibition at Cardiff if convenient arrangements could be made.

In Section A, which is devoted to mechanical and physical science, Professor Liveing, F.R.S., read a communication from Professor Piazzi Smyth relating to a comparison of some photographic representations of the solar spectrum made by eye some years ago (1884), and registered at the time by means of drawings. The eye is able to detect many details in the spectrum which are not reproduced by photographic processes, especially the separation of densely-crowded lines. The drawings made by Professor Piazzi Smyth were greatly admired, both for their accuracy and the artistic manner in which they were executed.

In the Geographical Section, Mr. John Thomson (London) read a paper on "Photography Applied to Exploration." He said:—My object in this paper is twofold—first, to show the growing importance of photography and its application to science, and secondly, to urge explorers to avail themselves more fully of the advantages it affords. The camera is an instrument of the highest scientific value, portraying as it does all visible objects with mathematical accuracy, the practical outcome of which may be seen in the reproduction to scale of maps, charts, plans, &c., by a single operation in the camera. The saving of time and labour thus effected is incalculable. Photogrammetry, or survey by photography, is now in use among engineers on the Continent and in America, but up to the present time this new departure has made little headway in this country. To the pioneer, whose object it is to map out a new route, picture new scenes, and provide the scientific world with perfectly accurate and trustworthy information, photography is of inestimable value. He has only to refer to the photographs he has taken *en route* to banish doubt, disarm the captious critic, and afford enduring evidence of work faithfully performed. Astronomical observations made abroad may be verified at home, and positions set down for guidance in map making. Such observations and registering of altitudes above sea level are matters requiring a separate scientific training, but beyond that there is much important work to be done in connection with the topography of a region, and such work, I maintain, lies within the scope of photography. Among other services which photography may render to the explorer, that of making observations depending upon proportional measurement is not the least. [The author then explained the details of a method of his own, whereby a perfectly reliable basis of measurement could be obtained.] He continued: The more general scientific use of photography may be indicated in taking evidence of the effect of erosion in drainage of mountain chains, the building up of delta by the detritus of rivers, the hydraulic force of streams in undermining and altering formations, in botany, for military purposes, and many other applications, commercial and scientific. Travellers, through the mistaken notion that the art can be picked up in the course of an afternoon, too often leave the photographic part of their training to the last moment. This is a fatal error, which I have been combating for years. Personally, I have studied and practised the art for over a quarter of a century, and still I have to study to keep pace with its progress. The author reverted to the subject of surveying by photography, suggesting that the surveying of the future will be performed by a captive balloon specially constructed and fitted for the purpose. This balloon may carry the camera, only to be worked from the ground by an electric current. It should be anchored by three cords from the corners of an equilateral triangular space, and its movements over the section of the space to be surveyed watched by means of an artificial horizon until the camera is over the centre of the section. The photograph should then be taken. A series of photographs, say, of a city in sections taken from a balloon could be joined together and photographed on one plate to form a complete map of the city. This plate, without touch of graver or pencil, could then be transferred to the printing press. (Numerous photographs taken by the author during his travels in the East were shown.)

Colonel Tanner, of the Indian Survey, said he had been advocating the adaptibility of photography to such work as the survey of portions of the Himalayas, which Europeans were not allowed to visit, and which the authorities in India had to map out as accurately as might be from a distance of one hundred miles. Photography in the hands of surveyors would greatly facilitate the mapping of the Himalayas, and would very considerably shorten the work. For ten years he had been endeavouring to make a map of Nepaul, no portion of which state had he been permitted to visit. All they had to go by was a representation of the chief mountain ranges, and they did not know the gaps in the ranges through which the rivers of Nepaul flowed. Photography would also greatly facilitate the survey of the highlands, covered with ice and snow, where his assistants were employed. One of his assistants was taking observations of a range of mountains 20,400 feet high, and he had to devote the whole of his time to recording observations in his note-book. He had not a moment to spare in order to take an outline of the great masses of snow mountains around him. He trusted that Mr. Thomson's observations would reach the Government of India, and that the system he advocated would be introduced in the Indian Service.

Mr. J. Coles thought that the question of the application of photography was in its infancy. He had applied photographs towards correcting the maps of the Russian Government of the region of the Caucasus. As to the application of photography to geographical discovery generally, he did not think that anyone could obtain so good an idea from a word picture as from a photograph, and it was of the utmost assistance in the making of maps. Photography in its application to the art of the cartographer would free us from the great liability of making errors.

The President pointed out that the Jungfrau had been surveyed and its contour outlined by means of photography. The photographic process of survey had been tested, and had been found most efficient, particularly where the ordinary surveyor had to deal with places which were inaccessible.

## LUNAR AND TERRESTRIAL VOLCANOES.*

Believing the trap-dyke theory to be the most plausible explanation, we would like to ask whether, in spite of no shadows having yet been detected, the rays may not be due after all to *slight ridges* of igneous rock welling out in a viscous state from long cracks, and so catching a little more light than the surrounding parts of the lunar surface. Such ridges might be no more than 100 or 200 feet in height, and if their sides slope gradually it might be impossible to detect their shadows. We may also suppose they consist of some light-coloured trap-rock, such as felstone, and to be "weathered" by the lunar atmosphere, thus presenting a somewhat whitened surface. It is quite possible that the lunar trap-rocks may be of a highly siliceous nature, like "volcanic glass," also that they may have been considerably weathered and whitened by the action of great quantities of steam, now absorbed by the moon, emitted in the last phases of lunar volcanic action. We know that steam can act chemically on glass, and turn it white. The lunar photograph in Mr. Ranyard's paper shows that the streaks are not nearly so bright as some mountains and craters, but this would easily be accounted for by the very great difference in height. Our idea is that the lunar mountain ranges are composed of volcanic rocks thrown up in some way from lines of fissure, and that the streaks are, as it were, attempts at lunar mountain ranges, which failed because, for some reason, the lava was not forced up in sufficient quantity. We rebel, for several reasons, against the idea of the lunar mountains being covered with snow. For instance, there is a great difference in the whiteness of different lunar mountains, which would be impossible if snow were the cause of the whiteness. But if they are composed of different kinds of trap-rock, it is extremely likely that they would weather differently, so that some might be whiter than others. Those, like basalt, of a more basic character (*i.e.*, with more lime and magnesia) would be of a darker colour, while others, like felstone (which is acidic and contains much free silica), would be of a lighter hue.

In looking over the beautiful pictures in Messrs. Nasmyth and Carpenter's book, we notice another point which seems to favour this idea—namely, that short lines of mountains are so often seen in connection with lunar craters, sometimes roughly radiating from them, sometimes all more or less in one direction. We observe this especially in the pictures of Gassendi (the frontispiece), Copernicus, Archimedes, Aristotle and Eudoxus, Trisnecker, Plato, Mercator, and Campanus, and also very plainly in the photo of Aristarchus and Herodotus. Again, the occurrence of craters in lines, in some cases, is another important fact tending to confirm this idea. (It will be remembered that terrestrial volcanoes run very markedly in lines.) It may be well here to quote the authors above referred to. They say (p. 98): "We have upon the moon evidence of volcanic eruptions being the final result of most extensive dislocations of surface, such as could only be produced by some widely diffused, uplifting force. We allude to the frequent occurrence of chains and craters lying in a nearly straight line, and of craters situated at the converging point of visible lines of surface disturbance. Our map will exhibit many examples of both cases. An examination of the upper portion (the southern hemisphere of the moon) will reveal abundant instances of the linear arrangement. Three, four, five, or even more crateral circles will be found to lie with their centres upon the same great-circle track; proving almost undoubtedly a connection between them, as far as the original disturbing force which produced them is concerned. Again, in the craters Tycho, Copernicus, Kepler, and Proclus, we see instances of the situation of a volcanic outburst at an obvious focus of disturbance."

On this theory, the dark linear markings on the moon, known as "hills" or "clefts," are probably cracks up which, for some reason, the molten matter only welled-up to some point below the surface. Perhaps they formed later than other terrestrial features, after the volcanic fires had died out, and when the linear surface was losing its old heat rapidly, and therefore cracking as it contracted on cooling.

It must be confessed that there is little to be said in favour of the view that the lunar streaks have been produced in a similar way to terrestrial "faults," for several reasons: First—the mountains of the moon, as far as we can see, are different to terrestrial mountains, and seem to be entirely volcanic, whereas our mountains are mostly due to the upheaving and folding of sedimentary strata; their present outlines being the result of long-continued atmospheric denudation. Secondly—it seems to me impossible, in the present state of our knowledge, to say whether stratified rocks are present on the lunar surface. If at one time there were seas, and an atmosphere at all like ours, "denudation" must certainly have taken place, and that would involve the accumulation of marine sedimentary deposits. Many believe that there is evidence of stratification, and even of tilted strata, in the lunar Apennines; but if this is the case, I should prefer to consider such strata as purely volcanic, viz., lava and ashes. Thirdly—terrestrial "faults" are very sharp lines of division, like the cracks which form in a sheet of ice after continued skating, so that we could not expect to see them.

One word in conclusion about "trap-dykes." These are veins of eruptive rock (basalt, &c.) filling up vertical or highly inclined fissures, and are so named on account of their resemblance to walls (*Scottice*, dykes). When the surrounding rock has decayed, the dykes may be seen projecting above ground exactly like walls. Sometimes the eruptive rock has followed the course of a "fault"; but in Scotland, at least, the vast majority of dykes rise along ordinary fissures which, having caused no displacement, cannot be considered as "faults." On the contrary, the dykes may be traced undeflected across some of the largest "faults." Dykes differ from veins in the greater parallelism of their sides, their verticality, and greater general regularity. Usually a dyke cannot be traced far, but the well-known Cleveland Dyke, in the north of England, runs for at least 60 miles, cutting through various "formations" till it reaches the Yorkshire coast,

* Concluded from page 598.

200 miles or more from the sheets of Miocene trap-rock with which it is probably connected. The south-western half of Scotland, and the northern parts of England, are ribbed across with thousands of dykes, which seem to be connected with the volcanic chain of the inner Hebrides (of Tertiary age). The fissures through which such dykes forced their way were not made by the molten matter itself, but more probably were the result of violent explosions and earthquakes proceeding from a region of volcanic action.

I must now conclude this paper, leaving the reader to judge if I am warranted in applying the trap-dyke theory to the lunar streaks. It certainly harmonises lunar and terrestrial phenomena, and suggests a close connection between radiating streaks, chains of lunar volcanoes, mountain ranges, and ridges or lines of hills near the volcanoes.

### Remarks by A. C. Ranyard.

If the reader will turn to the photographs of the moon, published in *Knowledge* for May, 1890, and October, 1889, he will see that the rays or streaks have not sharply defined edges, as they presumably would have if they were trap-dykes. The rays vary in breadth, many being from twenty to thirty miles broad, with very soft, nebulous edges. The whiteness of the rays in some cases may be seen to degrade gradually from a narrow, sinuous, bright band which runs along their centres—see, for example, the two rays from Tycho that run across the Mare Nubium, shown in the plate published in the May number for 1890. The rays seem in no way to interfere with the forms of the craters and irregularities of the lunar surface, as we should expect to find them interfering if they corresponded to a wall of injected rock either harder or softer than the surrounding material. A good instance of a broad ray passing over craters and rough ground without affecting the forms of the craters and mountains is shown in photograph No. 1, plate No. 1, in the October number for 1889, where a strikingly bright ray radiating from Tycho passes across the rough ground to the south of the Mare Nectaris, and then across the plain and onward.

Lava streams and volcanic regions on the earth are generally dark as compared with the surrounding rocks, but the light-reflecting character of these rays cannot be accounted for unless they are capable of reflecting more light than light sandstone, or even than chalk; for the light-reflecting power of the moon, taken as a whole, about corresponds to that of light sandstone. See the often-quoted observation of Sir John Herschel, who compared the light of the nearly full moon with that reflected from Table Mountain at the Cape. Everyone is familiar with the whitish appearance of the moon as seen in the daytime. It appears like a small, whitish cloud.

There are many large, dark areas upon the moon; consequently, the brighter parts must be relatively white as compared with light sandstone. It is true that the summits of lunar mountains and craters differ greatly as to their whiteness, but few terrestrial mountains are wholly covered with snow, and, as seen from a distance, their whiteness would depend upon the amount of rock surface and shadow intermixed with the snow. The moon, as a whole, reflects a little less than a quarter of the light reflected by fresh fallen snow. My argument is that the brighter patches and rays are so bright as compared with the rest of the moon's surface that their whiteness cannot differ greatly from the whiteness of snow.

---

Mr. E. J. Browne, of Liverpool, has hit upon the happy idea of making rubber stamps from half-tone photographs, and has sent us a specimen of his work in the shape of a profile portrait impressed at the head of his note-paper. This stamp appears to owe its origin to a coarse-screen process block. Such a stamp may be useful in lieu of signature for ephemeral documents—love letters for instance—and a still more practical use for it is indicated as a means of identifying a payee in a note payable to an individual.

## PHOTOGRAPHY AND THE SPECTRUM.

The following remarks were included in Dr. Huggins' address before the British Association at Cardiff last week:—

A very great advance has been made in our knowledge of the constitution of the sun by the recent work at the Johns Hopkins University by means of photography and concave gratings, in comparing the solar spectrum, under great resolving power, directly with the spectra of the terrestrial elements. Prof. Rowland has shown that the lines of 36 terrestrial elements at least are certainly present in the solar spectrum, while 8 others are doubtful. Fifteen elements, including nitrogen as it shows itself under an electric discharge in a vacuum tube, have not been found in the solar spectrum. Some 10 other elements, inclusive of oxygen, have not yet been compared with the sun's spectrum. Rowland remarks that of the 15 elements named as not found in the sun, many are so classed because they have few strong lines, or none at all, in the limit of the solar spectrum as compared by him with the arc. Boron has only two strong lines; the lines of bismuth are compound and too diffuse. Therefore, even in the case of these 15 elements, there is little evidence that they are really absent from the sun. It follows that if the whole earth were heated to the temperature of the sun, its spectrum would resemble very closely the solar spectrum. Rowland has not found any lines common to several elements, and, in the case of some accidental coincidences, more accurate investigation reveals some slight difference of wave-length or a common impurity. Further, the relative strength of the lines in the solar spectrum is generally, with a few exceptions, the same as that in the electric arc, so that Rowland considers that his experiments show "very little evidence" of the breaking-up of the terrestrial elements in the sun. Stas, in a recent paper, gives the final results of eleven years of research on the chemical elements in a state of purity, and on the possibility of decomposing them by the physical and chemical forces at our disposal. His experiments on calcium, strontium, lithium, magnesium, silver, sodium, and thallium, show that these substances retain their individuality under all conditions, and are unalterable by any forces that we can bring to bear upon them. Prof. Rowland looks to the solar lines which are unaccounted for as a means of enabling him to discover such new terrestrial elements as still lurk in rare minerals and earths, by confronting their spectra directly with that of the sun. He has already resolved yttrium spectroscopically into three components, and actually into two. The comparison of the results of this independent analytical method with the remarkable but different conclusions to which M. Lecoq de Boisbaudran and Mr. Crookes have been led respectively, from spectroscopic observation of these bodies when glowing under molecular bombardment in a vacuum tube, will be awaited with much interest. It is worthy of remark that, as our knowledge of the spectrum of hydrogen in its complete form came to us from the stars, it is now from the sun that chemistry is probably about to be enriched by the discovery of new elements.

Of the physical and the chemical nature of the coronal matter we know very little. Schuster concludes, from an examination of the eclipses of 1882, 1883, and 1886, that the continuous spectrum of the corona has the maximum of actinic intensity displaced considerably towards the red when compared with the spectrum of the sun, which shows that it can only be due in small part to solar light scattered by small particles. The lines of calcium and of hydrogen do not appear to form part of the normal spectrum of the corona. The green coronal line has no known representative in terrestrial substances, nor has Schuster been able to recognise any of our elements in the other lines of the corona. The spectra of the stars are almost infinitely diversified, yet they can be arranged, with some exceptions, in a series in which the adjacent spectra, especially in the photographic region, are scarcely distinguishable, passing from the bluish-white stars, like Sirius, through stars more or less solar in character, to stars with banded spectra, which divide themselves into two apparently independent groups, according as the stronger edge of the bands is towards the red or the blue. In such an arraugement the sun's place is towards the middle of the series. At present a difference of opiniou exists as to the direction in the series in which evolution is proceeding, whether by further condensation white stars pass into the orange and red stages, or whether these more coloured stars are younger, aud will become white by increasing age. The latter view was suggested by Johnstone Stoney in 1867. About ten years ago Ritter, in a series of papers, discussed the behaviour of gaseous masses during condensation, aud the probable resulting constitutiou of the heavenly bodies. According to him, a star passes through the orange and red stages twice, first during a comparatively short period of increasing temperature which culminates in the white stage, and a second time during a more prolonged stage of gradual cooling. He suggested that the two groups of banded stars may correspond to these differeut periods—the young stars beiug those in which the stronger edge of the dark band is towards the blue ; the other banded stars, which are relatively less luminous aud few in number, being those which are approachiug extinction through age. In the spectra of the white stars the dark metallic lines are relatively inconspicuous, and occasionally absent, at the same time that the dark lines of the hydrogen are usually strong and more or less broad upon a continuous spectrum, which is remarkable for its brilliancy at the blue end. In some of these stars the hydrogen and some other lines are bright, and sometimes variable. As the greater or less prominence of the hydrogen lines, dark or bright, is characteristic of the white stars as a class, and diminishes gradually with the incoming and increase in streugth of the other lines, we are probably justified in regarding it as due to some couditions which occur naturally during the progress of stellar life, and not to a peculiarity of original constitution.

To produce a strong absorption-spectrum, a substance must be at the particular temperature at which it is uotably absorptive ; aud further, this temperature must be sufficiently below that of the region behind from which the light comes for the gas to appear, so far as its special rays are coucerned, as darkness upon it. Consideriug the high temperature to which hydrogen must be raised before it can show its characteristic emission and absorption, we shall probably be right in attributing the relative feebleness or absence of the other lines, not to the paucity of the metallic vapours, but rather to their being so hot relatively to the substances behind them as to show feebly, if at all, by reversion. Such a state of things would more probably be fouud, it seems to me, in conditions anterior to the solar stage. A cousiderable cooling of the sun would probably give rise to bauded spectra due to compounds, or to more complex molecules which might form near the condensing points of the vapours. The sun and stars are geuerally regarded as consisting of glowing vapours surrounded by a photosphere where condensation is taking place, the temperature of the photospheric layer, from which the greater part of the radiation comes, being constantly renewed from the hotter matter withiu. At the surface the convection currents would be strong, produciug a considerable commotion, by which the different gases would be mixed and not allowed to retain the iuequality of proportious at different levels due to their vapour densities. Now the conditions of the radiating photosphere and those of the gases above it, on which the character of the spectrum of a star depends, will be determined, not alone by temperature, but also by the force of gravity iu these regions ; this force will be fixed by the star's mass and its stage of condensation, and will become greater as the star continues to condense. In the case of the sun, the force of gravity has already become so great at the surface that the decrease of the density of the gases must be extremely rapid, passing in the space of a few miles from atmospheric pressure to a density infiuitesimally small ; consequently, the temperature-gradient at the surface, if determined solely by expansion, must be expremely rapid. The gases here, however, are exposed to the fierce radiatiou of the sun, and uulcss wholly trausparent would take up heat, especially if auy solid or liquid particles were present from condensation or convection curreuts. From these causes, within a very small extent of space at the surface of the sun, all bodies with which we are acquainted should fall to a condition in which the extremely tenuous gas could no longer give a visible spectrum. The insignificance of the angle subtended by this space, as seen from the earth, should cause the boundary of the solar atmosphere to appear defined. If the boundary which we see be that of the sun proper, the matter above it will have to be regarded as in an essentially dynamical condition—an assemblage, so to speak, of gaseous projectiles for the most part falling back upon the sun, after a greater or less range of flight. But in any case, it is within a space of relatively small extent in the sun, and probably in the other solar stars, that the reversion, which is manifested by dark lines, is to be regarded as taking place.

## THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.*

### Abstract of Report of the Delegates of the Photographic Club.

The sixth Photographic Conventiou of the United Kingdom was opeued by the Mayor of Bath in the Guildhall of that city. After a speech of welcome from him, Mr. Bothamley, the retiring president, retuΓued thanks, and alluded to the fact that that city was iutimately associated with the early history of science and photography by the names of Fox Talbot and Herschel. He then vacated the chair in favour of his successor, Mr. William Bedford. The President, who was received very cordially, delivered his presidential address. He referred to Bath as of special iuterest to photographers, owing to its vicinity to Lacock Abbey, the first spot in the kingdom depicted by means of photography by Fox Talbot. After a remark on the increasing number of societies, the spread of literature aud journalism, and the success of recent exhibitions, he alluded to the scheme for the formation of a Photographic Institute somewhat similar to those already existing at Berliu and Vienna. He also spoke of the new premises of the Camera Club, and in connection therewith of their annual conference and one-man exhibitions, and of the photographic survey now being carried out by the Birmingham societies. He called attention to the investigations by Messrs. Hurter and Driffield on the effect of developmeut on the ratio of densities of negatives ; to the report of M. Lippmann's discovery of a means of reproduciug and fixing the colours of the spectrum ; and to Colonel Waterhouse's process for obtainiug a reversal of the image by the addition of thiocarbamides to the eikonogen developer. In optics the latest novelty was the lenses recently introduced by Zeiss, upon which Dr. Eder had so favourably commented. The primuline process of Messrs. Grecu, Cross, and Bevan, and the diazotype process of Feer were then dwelt upon, as well as Mr. Carey Lea's further experiments with allotropic forms of silver. After treating most exhaustively of the scientific discoveries and processes connected with photography, he dealt with the advance made in the artistic direction, not forgetting to comment on the new school, which, notwithstanding the renunciation of its former master, is still living, and, what is more, reaping due recognition of its merits. Eveu automatic photography was included in the address of our President.

On the following day, Tuesday, the excursion to Tiutern and Chepstow took place. On the Wednesday, after the general meeting and the meeting of the geueral committee, the group of members was takeu by Mr. Ashman, and, notwithstanding the rain, resulted in a most satisfactory picture. The afternoon and the eveniug of that day were devoted to papers, of which we will give but the briefest outline, the full text haviug been published in all the journals.

The subjects which occupied the council and geueral committee meetings were, priucipally, the place of meeting for next year's convention, and the affiliation scheme. Regarding the former, of the various iuvitatious sent for the 1892 gathering, the one for Edinburgh was accepted. As to the affiliation scheme, it having been brought forward ouly then, it was thought that the members were scarcely in a position to

* Read at a meeting of the Photographic Club, August 12th, 1891.

grasp its provisions, and it was therefore resolved that the matter be referred to the coucil for cousideratiou.

The first paper read was one by Mr. William Lang, upon "The Photographic Work of Herschel and Talbot." In it he mentions Fox Talbot's and Herschel's connection with Bath, and a contribution of the latter to the *Edinburgh Philosophical Journal* ou "Hyposulphurous Acid aud its Compounds." These experiments, which were the result of an accident, led Herschel to the production of other hyposulphites thau those of lime. Referring to the soda salt, he there stated that muriate of silver (now known as chloride of silver), newly precipitated, dissolved in this salt when in a somewhat couceutrated solution in large quantity. He further showed that zinc could separate metallic silver on being immersed in the hyposulphite solution. Several other experiments and papers by Herschel and Talbot are here quoted, but it would lengtheu so much this report that we refer you to the paper itself, which was printed *in extenso* in the photographic jouruals. It is worthy of notice that Mr. C. H. Talbot, son of the late Mr. Fox Talbot, was present at the reading of the above paper, and that he made some interesting remarks on his father's work in connection with photography. A selection of lantern slides from calotype negatives, and portraits of Herschel, Fox Talbot, and interesting scenes connected with them, were then shown on the screen.

Mr. Bothamley's paper on "Recent Developments in Printing Processes" then followed. The processes described are the kallitype, which is based upon Hunt's and Herschel's observations, that when a ferric salt is exposed to light, aud thus reduced to a ferrous salt, aud the ferrous salt is treated with a solution of nitrate of silver, metallic silver is precipitated in quantity dependent on the quantity of ferrous salt that has been formed on each part of the surface ; the Feertype or diazotype, and the primuline process, both of which are based on the use of coal-tar colours.

In the absence of Mr. Debenham, Mr. Traill Taylor read this gentleman's paper on "The Cult of Indistinctness," which attacks the tenets of the school which has produced such pictures as "The Poacher," "A Breezy Corner," and "Dedham Bridge." Perhaps, through not having been officially announced in the programme, this paper caused no discussiou between the lovers of softness iu pictures aud the admirers of a superabuudance of microscopical detail in photographic prints.

The eveniug was devoted to a most interesting lecture, given by Mr. Albert Taylor in the abseuce of Mr. A. A. Common, on "Recent Astronomical Photography," illustrated most profusely with a large series of lantern slides of astronomical photographic apparatus and reproductions of stellar photographs. Among the latter were some wouderful slides of the nebulæ in Orion, and of the moou.

Thursday was a busy day. Two excursions duriug the day, and report aud discussions on "Standards" in the evening.

The committe appointed to consider the adoptiou of the staudard lens fitttings recommended by the Photographic Society of Great Britain, or to suggest alterations in that system, preseuted their report.

Mr. Warnerke opened afterwards the discussiou on proposed international standards, and advocated very strongly the adoption of the decimal system, and also of internatioual staudards. He particularly emphasised the fact that any photographic standard suggested would not coufer complete benefit uuless it were universally adopted ; aud he therefore urged that this couutry be strongly represented at the forthcoming Congress iu Brussels.

Friday was a fine photographic day, aud the excursions to Wells, Glastonbury, and Lacock Abbey were, consequently, well patronised.

The annual dinner took place in the eveuing, the chair being occupied by the President, at whose right sat the Mayor of Bath. After the usual toasts followed a most enjoyable smoking concert.

The last day of the Convention, Saturday, nothing outside the council meeting was on the programme, but many of the members were busy during the greater part of the day photographing the many remarkable architectural subjects in the town.

Before we come to the second part of our report, we should like to state our deep gratitude to all those gentlemen who, by their kindness and hospitality, made our sojourn in Bath a most enjoyable one ; to the Mayor, Mr. Murch, for his courteous reception ; to the local committees for their untiring energy, which resulted in every arrangement being found perfect ; and to the deans, bishops, and other gentlemen for the permissions grauted. (Signed) H. M. Hastings.

F. P. Cembrano, jun.

The above report was illustrated by 114 slides made from negatives taken by the delegates during the Convention. The lantern was kindly lent by Mr. C. Lees Curtis. It is the same instrument as was used at the Bath meeting, and looked as perfect as when first made ; yet all it has had done to it since the Convention is the placing of a piece of sheet asbestos packing at the back between the woodwork aud metal lining, to prevent a repetition of the "yaller light" incident. The condenser is quadruple, and was made by Mr. C. Baker from calculations by Mr. E. M. Nelson. F. A. Bridge.

*Hon. Sec. Photographic Club.*

Photographic Club.—Subject for Sept. 2nd, "On Testing Lenses" ; Sept. 9th, "Printing by Development." Outing, Saturday, 29th inst., Hampton Court ; train from Waterloo, 2.10 p.m.

London and Provincial Photographic Association.—September 3rd, "Dark Room Appliances" ; September 5th, outing to Greenwich Hospital, conducted by Mr. A. Haddon ; September 10th, "Keeping Qualities of Dry Plates." Visitors cordially invited.

The Camera must go with the Ticket.—Some years ago the director-general was the great man of a world's fair, but considering au extraordinary liue of special artistic development since that time, the most important functionary now must be acknowledged to be the official photographer. The boss of this department for Chicago will be Mr. Camera Dryplate Arnold. Mr. Arnold's special work will be to take the buildings as they are built. Who shall officially photograph the Fair at its height for the purchases of the general public is for later selection. Another and much more important question relates to the general right of photography wheu Chicago shall open the show gates. The number of cameras of the amateur automatic persuasion is increasing in far greater ratio than the population. The adaptation of larger and more satisfactory sizes to the portable button-pressiug forms has progressed of late so successfully that the next few years may expect an enlargement of camera-carrying class, such as the already marvellous exteusion of the photographic fancy could scarcely suggest. The spirit of enterprise that animates the use of the camera is so vigorous, aud the number of its devotees will be so great by 1893, that not only will thousands of photographers be among the visitors of the Chicago Fair, but thousands will visit the Fair for the simple reason that they are photographers, and know that they will find in such an aggregation of men and things a memorable opportunity for the creation of interesting negatives. We disseut, therefore, from the proposition of our esteemed contemporary, *The Photographic Times*, that in Chicago, as in Paris, the privilege of photography should be sold to applicauts at sums fixed for amateurs and professionals. This branch of the artistic public is so large, and its work so desirable, that subjection to such discrimininátion from the rest of the population becomes an injustice. What more magnificent monument could be erected to the memory of Columbus than the recognition of the right of free photography? It is an indispensable feature of the scientifically progressive society that enjoys the other time-honoured blessiugs of the United States. At the great Columbian event a tax on cameras is not to be thought of. Let us all take views, if we desire, upon no other condition than the legal entrance iuto the grounds by the customary surrender of a ticket.—*New York Sun.*

## DOUBLES.

BY G. R. CROMWELL.

The making of double pictures has been a hobby with me for some time—in fact, several years. But I find I have kept the secret too long to be of any material value to me, or to receive any benefit from my patent application, having paid second money and received nothing; for, as you may know, I have experimented with pictures and the lantern since I was a boy. I remember when I was a child I threw the house into confusion with a tiny lantern. But it was always a passion with me, and what I am about to show you is one of my old tricks. I tried various methods of producing these doubles, with more or less success, as you will see. I finally hit upon a little box, a common cigar box with flaps or doors. With this little box attached to the hood of the lens, the door or flap opened on the side toward the subject, the first exposure is made, viz., with uncapped lens (doors closed); open first half (exposure), close again; and after the subject has changed position the other side, or double exposure, is made. This method is an attachment to the lens, and the doors being opened, first on one side and then the other, the cap cannot be used. But I do this same doubling without the box on any apparatus. This is it: A plain cigar box, blackened on the inside, is placed in front of the lens, covering one-half of the subject. It is as if the lens were an eye; the same as if I placed something in front of my eye. With the box cutting off one side it takes only what it sees; what the eye does not see it cannot take. This is a great aid to carry out Mr. Champney's instructions in reference to composing your foregrounds. When I went view shooting in Europe, and when I went to make a picture, I got down crouching behind the camera, and what I could not see I knew I should not get on the plate; I had no need to use a finder. So you have the same principle in taking double pictures.

I also make curious pictures with the guillotine shutter. Open the slide of plate, pull up the shutter, close, cover plate as if finished, change to opposite shutter, pull open the slide of plate again, pull up the shutter, close over plate, and develop. The result will be one background, but one or more figures repeated as placed on either side at the time of the exposure of the plate.

The best plan to double images on the plate, maintaining an undisturbed background, is as follows: To use a cap for the lens, also a box (cigar box will answer), black on the inside and edges at its opening. Place the box in front of the camera on a small stand, at the distance that the plate is from the lens when the focus is obtained. Make a mark on the table at the end of the box, so as to know, in changing its position, that the precise opposite is secured. Now to operate: Box in place, figure to be seen by open half of lens; expose, replace cap, change box and figure, uncap, close, and develop. Result, two figures—one and the same—one background, and no line of demarcation in its taking. Many lantern slides were exhibited to fully illustrate the successful use of the box with doors, the guillotine shutter, and the plain box. The simplicity of the process is at once evident.—*Phot. Amer. Review.*

---

Regarding the Convention at Buffalo, *Wilson's Magazine* has the following:—"A large number of amateurs availed themselves of the opportunity extended them to visit the Exhibition, and they generally found there were several things about photographing that their elders could teach them."

# Patent Intelligence.

### Applications for Letters Patent.

13,887. Arthur Kempson Penn and William Wallace Beasley, Claremont House, Claremont Road, Handsworth, "An Adjustable Vignetting Frame for Use in Photographic Printing."—*August 18th.*

13,950. Joseph Sedgwick, 37, Chancery Lane, London, "Improvements in Photographic Bags used for Changing Sensitised Plates."—*August 18th.*

13,964. Henry Foster, St. Wilfrid's House, Blake Street, York, "The Opaque-Negative Photo-Printer."—*August 19th.*

14,231. Herbert Weld-Blundell, 53, Chancery Lane, London, "Improvements in and connected with Photographic Apparatus for Surveying and Field-Sketching Purposes."—*August 19th.*

### Specifications Published.

4,704. *March 26th,* 1890.—"Magic Lanterns." F. H. Varley, Newington Green Road, London.

Relates to zoetropic cameras, which may be also used as magic lanterns. A sensitive film is wound on drums, one being the winding-on drum, and pass over guide rollers. The drums are actuated by springs in opposite directions, and are also in gear with one another, so that the tension of the spring of one drum serves to wind the spring in the other drum, thus serving to keep taut the sensitive film. The film is intermittently fed, in lengths equal to the part exposed between the rollers, by an oscillating lever terminating in a roller. The movement of the lever in withdrawing a length of film from the drum winds the spring of that drum, and as this winds the spring of the other, the latter winds on the film. Detents are used to prevent a reverse movement of the film. The shutter, which consists of a perforated disc revolving in front of a fixed perforated piece, is actuated by cams on a shaft. In a modification, the roller slides are differently actuated, and sliding shutters are used. Also the camera is provided at the back with a slide, which permits focussing, and also enables the camera to be fitted to serve for reproducing the zoetropic representations on a screen. [*Patent opposed. Case not yet decided.*]

---

# Correspondence.

## PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Sir,—Kindly permit me to remind intending exhibitors that Monday, September 14th, is the last day for receiving "packing cases" from the country by our agent, Mr. Bourlet, 17, Nassau Street, Middlesex Hospital; and that Wednesday, September 16th, is the only day for receiving pictures and apparatus at the Gallery, 5a, Pall Mall East, S.W. Entry forms and further information may be obtained from me.

H. T. Lawrance, *Assistant Sec.*

50, *Great Russell Street, Bloomsbury, W.C.*

---

## PERSPECTIVE DRAWING AND VISION.

Reply to Mr. Wheeler by Dr. P. H. Emerson.

Sir,—I do not know what Mr. Wheeler's theory of the visual perception is, but I feel sure Mr. Wheeler has but sipped at the spring of psychology—that is, to judge by his remarks. Mr. Wheeler ought to know that the "ignoring of well-accepted theory" is nothing against original experiment, whereas, for "the confusion of thought," that may be subjective and not objective.

Mr. Wheeler says, "the accepted mental theory, according to which distance can never be directly seen as such—that is, *it can never be apprehended as simple sensation.*" Now Mr. Wheeler shows by this remark that he knows nothing of the will of the "sensationalist," by whom the third dimension is considered to be a pure sensation. Such is the accepted theory of the sensationalists, and I am altogether with them, our researches being in their favour, and against the Berkleyans *et in genus omne.* Wundt's life has been spent in constructing a space theory, to my mind valueless, and I can say again, with one of the profoundest living psychologists, who emphatically calls "Wundt's 'theory' the flimsiest in the world."

So much for Mr. Wheeler's only accepted theory. I have shown the sensationalists have another theory.

Finally, all I have to say is, that since Mr. Wheeler seems to be innocent of the literature written against Wundt, Helmholtz, and Co., it is useless to open a disoussion. It only remains to state our observations are in no sense "judgments," but *pure sensuous impressions.*

Finally, I would recommend Mr. Wheeler to the works of Stumpf, Schön, Volkmann, Hering, and others.

P. H. Emerson.

## Proceedings of Societies.

Photographic Society of Great Britain.

At the technical meeting of this Society held on the 25th inst. the chair was occupied by Mr. W. E. Debenham.

The subject arranged for the discussion of the evening was "Photographic Printing Processes," and it was opened by Mr. Chapman Jones, who said that he took interest in two printing processes only, the carbon and the platinum processes. Photography was a recording process, and as such permanency was of the first importance. In the matter of colour, we ought to be prepared to give up a little for the sake of permanency. With the carbon process, however, any colour could be obtained, and if in time the colour did change somewhat, the print could not be said to fade. Silver prints did not always fade, but there could be no guarantee that they would not do so. Silver prints that he had made himself he had not found to fade except when he had experimentally prepared them with a view to fading. Bromide prints had been called permanent, but here again they had been found to fade, and, therefore, the title was not justified.

Mr. F. Ince had found carbon tissue to stick to the negative and spoil it.

Mr. Chapman Jones asked whether Mr. Ince's negatives had been varnished.

Mr. Ince said they had not.

Mr. Chapman Jones said that the object of varnishing the negative was not to preserve it when put by, but to enable it to withstand injury whilst printing.

Mr. Holiday wished to know if a silver print fixed without being toned was as permanent as a toned print. He considered the colour of the untoned print was so much more beautiful and artistic than the cold tone of the ordinary photograph.

Mr. W. England said that thorough toning was conducive to permanency, and so was a thorough washing.

Mr. A. Mackie said that a thorough fixing was also necessary to permanence. He advised the use of two fixing baths in succession.

Mr. Chapman Jones said that long washing was not necessary. He believed that, by proper treatment, a print might be thoroughly washed in half-an-hour. He washed for a few minutes, then immersed in a dilute solution of iodine until the print showed blue on the black, and it was then washed again and dried.

The Chairman said that Mr. W. K. Burton had found that such a heavy deposit of gold might be given to a silver print that it would withstand the action of a solution of bichloride of mercury. This solution entirely bleached an untoned silver print. A print containing so much gold would have greater probability of permanency.

Mr. T. Samuel had made prints thirty years since that were still unchanged. He also had some that were made by Mr. Melhuish twenty-five years since. These prints were as fresh as ever. They were toned by a process published at the time by Mr. Melhuish, as one giving black tones.

The Chairman observed that Mr. Chapman Jones had said that we ought to be prepared to give up something in the way of colour for the sake of permanency. No doubt, for purposes of record, that was true, but if it was found that in some particulars we could get a better print by silver than with carbon or platinum, he would say let us have the better print as well as the permanent one. The point in which he considered an albumen print to be better than one in carbon or platinum was in the matter of gradation. A carbon print was generally somewhat deficient in rendering gradation in the lights, and a platinum print similarly deficient in the shadows. As to the matter of colour, he considered that, as well as the condition of surface, whether matt or glossy, to be matters of indifference compared with a truthful rendering of the gradation of the negative. For colour, however, the public had decided in favour of that of a successfully toned print on albumen paper.

Mr. T. Bolas enquired of Mr. Holiday whether he found the colour that pleased him at one time did so at another.

Mr. Holiday replied in the affirmative.

Mr. Bolas thought it would have been the other way, and that the appreciation of colour was a shifting quantity.

Mr. Chapman Jones said that an infinitesimal amount of silver served to give a strong colouration. If this colour changed by fading, there was not enough of the metal to have the image brought out again. He thought that this was a fact which had been overlooked in a recent article on the subject in one of the journals.

Mr. A. Mackie asked whether anything more had been heard of the iron printing process, specimens of which were shown by Professor Meldola at a lecture at the Society of Arts.

It was replied that Professor Meldola's lectures were shortly to be published, and that occasiou might be utilised to obtain further information on the subject.

Mr. A. Glasse said that the character of a print depended much upou that of the negative from which it was made. With the strong negatives of former days it was easier to get a vigorous print such as might be expected to withstand the influence of fading, than with the thinner negatives now prevalent. Then he thought that the large amount of albumen now spread on the paper was conducive to fading. Formerly the coating of albumen was very dilute. A silver print was the richest in colour and most vigorous, and the best that could be given to the public or to the art world.

The Chairman thought that two statements that were frequently made concerning differences between the prints of the present day and those of thirty years or so since were mistaken. It was asserted that negatives were made much more intense then than now, and that the albumen coating was much lighter than at present. With regard to density, although it might be that the tendency of the inexperienced was to get too great density with pyro-developed collodion negatives, and to get too little density with gelatine negatives, he believed that the standard of experienced workers was about the same now as formerly. The time of the exhibition of 1862 was a convenient epoch for reference, and as one set of examples he mentioned the work of Mr. England, taken at the exhibition of that year. He would ask whether the negatives then takeu were not of about the same density as what would now be considered right. As to the albumeu coating, it was considerably earlier than that that the practice was to use albumen with as little water as was just necessary to dissolve the salt used.

Mr. England said that the negatives referred to by the Chairmau were of about the density of those of the present day, and that as strong an albumen coating as could be given was applied to the paper.

It was asked whether sulphur was not a constituent of albumen, and Mr. Bolas replied that that was a moot point. Sulphuretted hydrogen was formed wheu sulphates were present in company with organic matter. Wheu casks of spring water were sent to sea, it was found that the sulphate when present became decomposed, and so much sulphuretted hydrogen set free as to cause the water to smell and give the idea of some dangerous putrefaction having set in. The water was, therefore, left open for a time to allow of escape by evaporation and re-oxidatiou into sulphate.

Northern Tasmanian Camera Club.

The second annual meeting of the above Club was held at Mr. R. L. Parker's rooms, St. John's Street, Launceston. Mr. R. L. Parker occupied the chair. After the minutes of the previous meeting had been confirmed, and some correspondence read—

The Secretary read his report, in which he stated that during the year the number of members had increased from twenty-eight to thirty-six. The meetings had been fairly attended, considering so many members reside in the country, those meetings especially being in favour at which lantern work or practical developing formed the principal feature. A field-day was held at Westbury in January, when a goodly number of members attended; and a second excursion, covering two days, took place in March; the scene of operations on the first day being Latrobe, the second day Devonport. Through the kindness of the president (Dr. H. A. Roome), Messrs. William Aikenhead, P. C. Maxwell, John Sykes, and others, these excursions were most enjoyable, and the hearty thanks of the Club are due to these gentlemen, whose kindness and thoughtfulness made the excursion so successful. As a means of improvement in practical work these field-days are most useful. Two prize competitions have been held during the year, the first in "Indoor Portraiture," in which Mr. William Aikenhead took first certificate, Mr. F. Styant Browne second, and Mr. R. L. Parker third. The second competition was in "Objects in Motion," in which Mr. William Gibson, jun., secured first certificate, and Mr. F. Styant Browne second. Mr. S. Spurling acted as judge in both these competitions. The circulating albums have been most successful, members contributing freely and regularly, and the change in the rules permitting the member obtaining the most votes to retain the album has met with universal approval. During the year, albums have been awarded to Messrs. William Aikenhead, P. C. Maxwell, and F. Styant Browne. The exhibitions of lantern slides, made by members from their own negatives, have been most interesting, and were much appreciated. Recently His Excellency the Governor has kindly consented to accept the position of patron to the Club. The returns of income and expenditure were submitted in the treasurer's statement, and, although the expenses had been heavy, the report was very satisfactory, as when some outstanding subscriptions have been collected, a credit balance will remain. The journals subscribed to by the Club had been in good demand, and books, &c., were kindly donated from time to time by the president and other members.

At the conclusion of the reading of the secretary's and treasurer's report, office-bearers were elected for the ensuing year, with the following result:—*President*—Mr. R. L. Parker; *Vice-Presidents*—Mr. P. C. Maxwell, Mr. A. C. Bonner; *Committee*—Rev. A. H. Champion, Mr. R. Kermode, Mr. F. W. Stewart; *Secretary, Treasurer, and Librarian*—Mr. F. Styant Browne. Hearty votes of thanks were accorded to the retiring president (Dr. Roome) and to the secretary (Mr. F. Styant Browne) for their services during the past year.

It was decided that a club exhibit should be prepared for the forthcoming Tasmanian Exhibition; that the date of meeting in future should be the third Wednesday in the month, instead of the second, as heretofore; and that each member should be entitled to bring two ladies to the lantern evenings. An exhibition of members' slides closed the evening.

The Camera Club have reason to be pleased with their continued prosperity, and, taking into consideration the growing taste for the artistic and fascinating pursuit of amateur photography, there is every prospect of the Club growing much larger before the next annual meeting.

---

Messrs. York and Son, of Notting Hill, have just issued their twenty-second annual supplemental catalogue, which contains many novelties in the way of the ever-popular lantern slide. The new subjects include: "One Thousand Miles up the River Congo," with a series of fifty slides from direct negatives of the scenes portrayed; a new temperance story, "Ten Nights in a Bar Room," from life models; scenes from the life of John Wesley; "An Hour with the Church of England"; "The Riviera"; "A Visit to Madeira"; and many other items of a very interesting character. The excellent quality of Messrs. York's lantern slides is well-known, for they are to be found in all the civilised, and in a large proportion of the uncivilised countries throughout the globe.

# Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

Colourist.—*The Blind Spot in the Eye.* Professor Huxley devotes twenty-four pages (Lesson IX.) in his "Elementary Physiology" to the organ of sight, and at page 244 gives a diagram by which it may be proved that you have a "blind spot," which coincides with the position where the bundle of fibres constituting the optic nerve enters the eye. It is a simple experiment that anyone can try for himself: On a white card draw a cross on the left, and a round black spot to the right of it, about two inches apart; now, closing the left eyelid, look intently at the cross with the right eye about a foot off; on bringing the card nearer to the face, the black spot will then alternately disappear and reappear; blindness, or total loss of image, will occur at about six inches distance.

A. P. S.—*Automatic Photography.* We have no information beyond that already published in the daily papers. The general working and construction of the machines were described in the News of May 22nd and 29th last.

Edgbaston.—*Retoucher.* Advertise or consult the advertisement columns; for a short time ago there was something like a strong demand for services such as you could render. Watering places, rather than metropolitan establishments, want help just at this time of year.

Executor.—*Scientific Books and Periodicals.* If you let us see a list, we might be able to advise you; so much depends upon the class of literature which you have to offer. Each department of science seems to have its special mart or channel, and very often secretaries of societies will make a bid for their own official publications in order to complete their sets.

M. A. B.—*Hand Camera.* We should like to have a brief report when you can find time to favour us with a few lines. The inventor gave us a practical hint last week that may be of service to you. It is that at the time of changing each plate the front of the camera should be tilted up, just as in charging the magazine.

J. S. B. (Norwich).—*Celluloid.* A compound of a low-nitrated cellulose (pyroxylin) with camphor, obtained by thorough incorporation of the two ingredients at a temperature barely sufficient to melt the camphor, the material being afterwards flattened out between hot plates or rollers. Some of the camphor evaporates off on exposure to air, but the films always retain the aromatic odour of that substance. It is soluble in alcohol, glacial acetic acid, and other solvents, forming with the first-named a very good varnish. There are two large producers in America, whose rival claims formed the subject of a law-suit (see report in the News of March 21st, 1890). Mr. H. Walker, of the Eastman Company, gave an early account of it and demonstrated its use at the Camera Club, and Col. Waterhouse mentions its adaptability to drawing and printing purposes. See the News of February 7th and May 6th, 1890, respectively. *Second Letter.*—You might be able to get them from the Xylonite Company, Homerton, London, N.E.

Quadragesimus.—*Aluminium Castings.* Flat plates, bindings, and racks may be stamped out and shaped with dies from the aluminium sheet, but the metal does not work well under the file. With the bronze alloy there is no difficulty. Apply to the Aluminium Company, Birmingham, for the castings.

T. H.—*British Association.* Except in regard to the weather, which seemed to affect the attendance, the Cardiff meeting was a decided success. Photography came well to the front, both by mention and specimens, and the exhibition of the local society (550 frames) was very well worth seeing, especially the Welsh antiquities shown by the Glamorganshire Survey.

**THE PHOTOGRAPHIC NEWS.**



EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1722.—*September* 4, 1891.

CONTENTS.



## WILL PHOTOGRAPHY KILL WOOD-ENGRAVING?

This question must have often occurred to thoughtful persons as they turn over the pages of our numerous—perhaps too numerous—illustrated publications; for the trail of the serpent, in the shape of impressions from "process" blocks, is over them all. A large proportion of these publications, indeed, would never have come into existence at all had not photography pointed the way to produce cuts without the necessity of cutting, and imitated the wood-engravers' work so well that none but the initiated were able to detect the innovation.

So far as convenience of production and economy are concerned, there is no question that a process block has many advantages over a wood-cut. In the old days, the artist drew direct upon the wood-block, and in the process of engraving the original was of necessity destroyed. In this way thousands upon thousands of drawings of the highest class, which have illustrated books without number, have perished in the process which made them available for public use. It is not so now. An artist of to-day is commissioned (say) by a firm of publishers to illustrate a book, and the pictures are duly sent in to them drawn with pencil or brush upon Bristol board—pictures in black-and-white. Many of our readers must be familiar with the appearance of these beautiful drawings, for they have often had an exhibition all to themselves. Some are most elaborately finished in pencil, others are roughly painted-in with india-ink and Chinese white, the wood-engraver being depended upon to translate these shades into proper "tints" with his graver. The drawing, having been approved, is photographed on to the wood-block—being generally reduced to the size required by the camera—and the drawing, having now served its purpose, is put away. But is it done with? By no means; for if the artist have a name, it is a thing of value which can be sold, very often for a larger price than that paid originally to the artist for its production. In a recent exhibition of such works we noticed that the price asked for them varied from half a sovereign to twenty pounds or more, and some of them were remarkably cheap at the price. This exhibition is an annual affair, and is promoted by one of our largest publishing houses to get rid of their constantly-accumulating collection of works in black-and-white.

It will thus be seen that one of the first advantages in making use of photography is in saving the valuable original drawing from destruction. But in this case we are considering the use of photography only so far as it is required in transferring the reversed image of that drawing to the wood-block. The engraver has still his work to do in translating the photograph into a combination of lines and dots, which will afford a resting place to the printing ink so soon as the engraving has in its turn been translated into an electrotype.

But the real economy comes in when the drawing is translated direct into a metal printing block by what is known as "process work." In this work the wood-engraver is left entirely out in the cold; his skilled hand and unerring eye are not required, both being replaced by the work of the camera. In simple line work, there is no question that the simple zinco process gives results equal to the best wood-engraving; every line is most faithfully reproduced in the finished block, so that the artist is able to rely upon an absolute *fac simile* of his design. But when we come to consider the process which reproduces drawings in half-tone, the case is somewhat different. We do not mean that the copy is not as faithful a one as in the other case, but there are certain difficulties in the after-process of printing which must often make both printers and readers wish that the wood-engraver had had the work to do instead of his optical rival.

To the American publications we must look for the most perfect development of this art of printing from process blocks. Their paper, with its finished glaze, is well adapted for the work, and there is no doubt that they excel in their methods of printing. In such careful hands, and provided that the printing operation is not hurried, process blocks give very wonderful results. But when such blocks have to be used for illustrated papers of which tens of thousands of copies have to be issued weekly, the time and care which it is necessary to give to these fine-grained, shallow blocks becomes an impossibility, and a blurred and generally faulty reproduction is too often the result. Of course there are exceptions, and we can point to many admirably printed pictures from such process blocks in our own leading illustrated journals; but, as a whole, they are not so satisfactory as the wood-cuts they have so much superseded.

To answer the question which forms the title of this article. We do not think that photography will kill wood-engraving, and much as we have the interests of the former at heart, we most sincerely hope that wood-engraving will always keep a forward position. It is certain that it will continue to hold its own with regard to sketches "from our special correspondent at the seat of war"; for such sketches are necessarily rough in their character, and invariably pass through the hands of a capable artist at home, who, from their somewhat vague outlines, draws a finished picture on the wood, which is afterwards engraved. In certain cases where the original drawing is of a more finished character, and is in line, the original is reproduced by process. Such a picture has always an additional interest attached to it, from being a *fac simile* of what the artist drew on the spot.

## PRICES OF RARE METALS.

As some of the rare metals of the platinum group are attracting more or less attention for photographic purposes, the following list, with prices attached, will prove of interest.

The rarest metal—and it is so rare that recent discoveries have thrown doubt on its elemental character—is didymium, and its present market price, if anyone may thus term the quotation of an article that never appears on the market, is 4,500 dollars per pound. The next costliest metal is barium, an element belonging to the alkaline earth group; its value is 3,750 dollars. Beryllium, or glucinum, a metallic substance found in the beautiful beryl, is quoted at 3,275 dollars. Yttrium, a rare metal of the boron-aluminium group, so called because first noticed at Ytterby, in Sweden, is stated to be worth at present 2,250 dollars per pound. Niobium, or columbium, a name suggestive of the American origin of the metal, it having been first discovered in Connecticut, is valued to-day at 2,000 dollars per pound. The price of rhodium, an extremely hard and brittle substance, which owes its name to the rose-red colour of certain of its solutions, is also 2,000 dollars. Vanadium, deriving its title from one of the appellations of the Scandinavian goddess, Freya, and at one time considered the rarest of metallic elements, has been reduced in price to 1,775 dollars, at which value there will, no doubt, be many eager buyers. Iridium, a very heavy metal of the platinum group, so named from the iridescence of some of its solutions, and well known in connection with its use for the points of gold pens, may be bought to-day at approximately 700 dollars per pound. Osmium, another metallic element of the platinum group, is hard, infusible, and the heaviest substance known; its present value is 625 dollars per pound. Palladium, a silver-white, fusible metal used in the manufacture of certain parts of time-pieces, and occasionally applied in dentistry, is worth 500 dollars per pound. The present price of platinum, the better-known tin-white, ductile, but very infusible metal, is on a par with that of gold—viz., about 350 dollars per pound.—*American Journal of Photography.*

## PERSPECTIVE IN VISION, AND IN PHOTOGRAPHY.

BY W. H. WHEELER.

### Some Effects of Plane Projection—Resources of Photography Greater than Artists suppose.

In endeavouring to compare the perspective of natural vision with that of photography, we are met at the outset by the difference between the necessary conditions of a view depicted on a plane surface, such as a sensitive plate, from: First, the depth and solidity of nature; and secondly, the conditions of our visual sense and perception of it. We ought to know each of these sets of conditions before attempting really to compare them, and yet it is by comparison that their distinctive features become most striking. We will endeavour to point out those most important as we go on. Perhaps the process of copying from a rectangular original, which needs to be reproduced without distortion, to another true rectangle, is the one with whose conditions photographers are most generally familiar in this connection, and with which we propose to begin.

We all know that for a straight and true reproduction of this kind, it is necessary—and, with a rectilinear lens, nothing else is absolutely necessary—that the *planes* of both the original and the copy be truly parallel to one another. For good optical definition it is well, too, if the line of sight, which should then also be the axis of the lens, is placed in a position perpendicular to both these planes, and also so as to join their centres; though small differences are unimportant even for definition, and, as regards distortion, neither of these conditions are essential at all, whether with a lens or with a pinhole. But that the planes of original and copy be truly parallel to one another is *absolutely* essential; for then, and only then, all the lines from points in the original, passing through stop or pinhole to their corresponding points in the copy, bear strictly the same proportion to one another. The scale of reproduction is then the same all over, and the copy (provided the stop or pinhole be sufficiently small for good optical definition) will accurately reproduce the original in shape as well as in detail.

Just so it is if we set up our camera exactly in front of a building. Provided our lens is rectilinear, and the plane of our picture parallel to the face of the building, both vertically and horizontally, we may tilt our camera until it points obliquely towards both the building and the sensitive plate; yet, provided the back is kept vertically and horizontally to this true parallelism, both vertical and horizontal lines will be parallel on the plate, just as they actually are on the building itself. Such a picture, it is true, will probably be too stiff and symmetrical to be either artistic or pleasing—that is another matter altogether—but it will be an accurate reproduction in form of the original, and the face of it will be *true to scale*. In such a case, photographic methods of measurement will certainly not be fallacious, nor will they mislead if, instead of tilting our camera and adjusting by the swing-back, we move a sliding front vertically or horizontally so as to bring our lens opposite a margin of the plate instead of its centre. Neither a central position for our lens, nor perpendicularity of the line of sight to the plane of the plate or of the building, are conditions that affect anything beyond accuracy of optical definition. The lines of any surface in the object which is parallel to the plane of the sensitive plate will always be reproduced in their true proportions.

We may thus see that Anton M. Haschek, in the generally excellent article printed in the Photographic News of August 14th, has failed to do full justice to the means actually at the command of a skilful photographer. For, in fact, both figs. 2 and 3 of that article might have been photographed direct from buildings such as they represent by appliances readily attainable, although they are introduced as examples of a free-hand in perspective, impossible to photography. It is really an error to suppose that, to photograph an archway so as to be symmetrical with other arches seen through it, it is absolutely necessary "to place ourselves exactly before the middle line of the opening," always provided we have the needful appliances to attain our end otherwise.

It is sufficient that the *plane* of the sensitive plate be perpendicular to such an imaginary line of sight, and so made parallel to the face of the building. The *actual* line of sight may be different, and if the camera were placed opposite the point of sight indicated in the figure as on one side, and the front carrying the lens then moved horizontally, so as to be away from the centre, and also on one side (but the opposite side to the indicated point of sight), the perspective effect obtained might be precisely that of fig. 2. The desired symmetry in the drawing of the arches will follow from the plane of the sensitive plate being made parallel to the plane of the building. The desired want of symmetry in the different foreshortening of the two side walls will also follow at the same time from the actual position of the lens, opposite to the indicated point of sight on one side of the archway. It must be noted that this necessary position of the lens is its place relative to the *object*—not as relative to the sensitive plate. The effect is as though the lens were fixed, and the plate moved to one side sufficiently to take in the required extent of subject, obtained as though on part of a larger plate. Of course the covering power of the lens must be sufficient for that larger plate—larger than the one actually used—and the result might have been more simply, but less conveniently, obtained by taking a larger wide-angle photograph on the same scale, and cutting away part of it. Fig. 3, indeed, is so obviously like part of a larger wide-angle view that we can plainly see it would be quite simple in execution. When so many professional photographers, accustomed, perhaps, to a rising-front, but not to one laterally adjustable, are unaware of the full resources of their art, no wonder if artists fail to do justice to those resources. Let us hope that, when recognised, photographers will more often avail themselves of means they had overlooked, and secure the advantages described by M. Haschek, though he thought them denied to us. An artistic use may thus be found for the wide-angle lenses and small stops so much decried by artists who do not understand the means and resources of photography so well as they know their own art.

The special present purpose, however, of our example of straight and symmetrical reproduction is not so much this latent artistic value, as the nature and reason of its harmony with our ordinary visual perception, though there it results from different causes, and is arrived at through entirely different means.

We trust to explain these means as the result of mental action combining and interpreting our crude visual sensations, and transforming them into such intelligent visual perception as can not only satisfy our curiosity in the recognition of objects, inform and guide us by a quick and general perception of the world around (which we could otherwise only know through the slow, tentative processes of touch or smell), but also kindle our emotions with a sense of beauty. Now it is axiomatic that the very idea of beauty implies a perceiving mind; it is not even conceivable apart from such a mind, and though, doubtless, we may say that a mind implies a brain, because always united with it in our experience, yet we know that the brain cannot be *thought*, any more than the eye is *sight*. They are the organs by which we think and see; they do not think or see for us. As Addison said long ago, and the most modern science can go no further, it is the *whole soul* (not the separate faculties into which we divide it for convenience sake) that remembers, understands, wills, or imagines. And "what we call the faculties of the soul are only the different ways or modes in which the soul can exert herself."* This soul, he also remarks, "can understand, will, imagine, *see*, and hear."†

To demonstrate the necessity of this mental action, and to show its nature through the visual processes involved, we will return to our camera, set up exactly in front of a building, and suppose an observer to place himself where the camera stands, opposite its base, looking upwards to see its summit line, and on each side to observe its horizontal prolongations. Now, it is easy to perceive that the image on the concave surface of the observer's retina cannot correspond with the true proportions of the building as the photograph does, because that concave surface cannot possibly be parallel to the *plane* of the building, and no image on a concave surface can ever truly represent that plane as one on a plane surface may, and, if also parallel with it, actually does.

We may put the case also from another point of view, that of persons who imagine our visual perception to correspond precisely with apparent form and dimensions, such as result from the angles subtended by the different parts of an object, according to their differing distances from the eye. We shall see, however, that neither will the varying scales of such apparent results accord with the ordinary visual perception, for, as the summit line of the building between any two perpendiculars is more distant from an observer standing at its base than the base line would be, it *must* subtend a smaller angle at the eye than the base line does. Consequently, these two perpendiculars could not appear parallel‡; and if our visual perception really corresponded with the apparent angles subtended, the necessary result would be just such a distortion as when we tilt our camera upwards, neglecting to use the swing-back, by which these longer lines of sight from the summit of the building to the lens are balanced in their effect on the scale of the picture, its use lengthening the same lines between the stop and the bottom of the plate in exactly the same proportion. Of course, nothing even resembling this balance can take place when the image is received on a concave surface, such as the retina. The result of a direct consciousness of the retinal image would necessarily be that lines which should be straight would be seen as curved, both vertically and horizontally, thus

* *Spectator*, No. 600.

† Of course we understand by the "whole soul" the whole living being. I have elsewhere contrasted the mental with the physical *side of our nature*.

‡ I am aware that this discrepancy was pointed out many years ago, though, perhaps, generally lost sight of. It was then contended that, for this reason, painters ought commonly to represent such vertical lines, not as strictly parallel, but as converging upwards. Sound common-sense and sound artistic feeling prevented the general acceptation of this idea—except, perhaps, to a small extent, in extreme cases; but I am not aware that any serious attempt was then made to show how and why, in our ordinary visual perceptions, we do actually see vertical lines as parallel.

producing a distortion similar in kind, but far greater in degree, than the barrel-shaped distortion of the image made by an ordinary single lens when used with the stop in front. Whichever way we regard the case, it is simply impossible that a plane surface, whether of a picture to be copied, or of a building to be photographed, can be truly reproduced by an image received on a surface which is not also plane* and parallel.

As nothing, perhaps, in the whole theory of vision is more certain than the fact that we are not conscious of the whole image on the retina *as such*, seeing, as we always do, the upright object—not the inverted image—the lines of a building as rectilineal, and not as curved, like the image formed on the retina: that fact scarcely needs the proof afforded, really, though not formally, a mathematical demonstration; that our visual perception, though necessarily based on sensation, *does not necessarily coincide with it.* As we shall endeavour to show, the visual image owes its form—perhaps even more than its structure—rather to the mental processes of a combining memory, and an intellectual interpretation of the signs presented to us through sensation, than immediately to the sensation itself.

We have seen that the image of a plane surface will always be correctly represented as to form when depicted on another plane surface parallel to it; and that vertical lines are then parallel in the photograph as in the building itself. Painters also represent them as parallel in their pictures, and architects draw them so in their plans. I may too, I think, safely appeal to our common experience, that we always see them so in natural vision, and expect so to see them in any pictorial representation. But how does it come about that we *do* so see them, such vision not agreeing with the apparent angles subtended, nor with the image on the retina? The answer may properly be, because it *does* correspond very precisely with the *true form* of the object, and is a striking example of the fact that *it is true form*, rather than apparent form, which habitually dominates our visual perceptions. Though, however, we thus speak of the form that actually exists—the tangible form—as true form, it is right we should bear in mind that neither visual nor photographic perspective are properly matters of truth or of falsehood. The actual (or tangible) form of an object is one true fact; the (so-called) apparent form, corresponding to the angles subtended, and necessarily varying with varying distance and position, is another true fact. The two are quite incompatible in any single physical representation; but in the mental image which is the true visual perception, their differences tend to melt into one another, according to the varying strength of dominant preconceptions; and as the eye "wanders" over the whole, running along vertical lines, and recognising their true verticality; along horizontal lines, and recognising them as actually horizontal; and recognising also the actual parallelism of successive pairs of lines, our mental image of the whole scene is gradually built up. It is thus that a compromise is arrived at between our judgments of apparent magnitude and our estimates of real magnitude, as well as of our perceptions of apparent form, and our knowledge of true form. It is thus also that we apprehend *distance*, inferring it from the various signs presented to us in sensation, and uniting with it such conception of magnitude in distant objects as invests our perception of them with a dignity which would not otherwise be associated with the small angle under which they are seen. And it is thus—our gaze dwelling and lingering on the most interesting objects, while passing more rapidly over others—that the whole scene gathers order and purpose. Selection and emphasis arise in the mind, and we gradually learn to make pictures for ourselves. Finally, it is thus that a just sense of perspective is, to a perceiving mind, the latest resultant of its intellectual and emotional forces, modifying, as they interpret, the visual sensations.

The mental process above-described may seem long and complex, quite absurdly long for an "impression"; but "thought is quick." This is not all, however. Our practical results are probably, in general, far less those of direct present inferences than of an association of ideas resulting from previous inferences, and thus the general result may be hastened and simplified. These mental processes, too, being rarely accompanied by any consciousness, we—thinking of the objects we are looking at, and not at all of the process by which we recognise them—are not apt to realise that process. Still, the common forms of speech, "Cast your eye over it," "Run your eye along it," do seem an evidence of some general practical recognition of the means by which we habitually judge of form and magnitude.

Perhaps I ought here to remark that it is necessary, in dealing with this subject, to distinguish more carefully between the strict meanings of the words "sensation" and "perception" than is at all necessary in their common use. "Sense-perception" is a not-unfrequent phrase, and the similar one "sensuous impression," may serve very well to express the effect of a hasty glance, in which feeling is supposed to predominate over the results of an intellectual process, though whether feeling or emotion be not itself a product rather of the mind than of the body—rather of perception than of mere sensation—may well be doubted.* Perhaps, like a chemical combination, it should rather be looked on as a new product. I am not clear, however, as to what is the idea generally associated with the word "impression." Of course an impression on the eye really means an impression on the brain, which is to us a mental impression.

Professor Max Muller remarks that M. Flourens proved by experiments that "if the roots of the optic nerve are removed, the retina in the eye of a bird ceases to be excitable, the iris is no longer movable; the animal is blind, because it has lost the organ of *sensation*. If, on the contrary, the cerebral lobes are removed, the eye remains pure and sound, the retina excitable, the iris movable. The eye is preserved, yet the animal cannot see, because it has lost the organs of *perception*.†

I see that I have left myself no space for the wide difference between the relations of visual and photographic perspective when taking a straight and symmetrical view of a building, from those which exist when, on the other hand, we direct our gaze and our camera *obliquely*—especially if from so near a point of view as to necessitate the use of a wide-angle lens—and must postpone that to another opportunity, if space can be found for me. I may say, however, that the same sense of real form which corrects the distortion shown necessarily to characterise crude sensation in the straight and symmetrical view—could

* We of course leave out of consideration the unpractical case of a distorted image received on a distorting surface so contrived, as by opposing action, to correct one another. That would be only a toy.

* Hartmann explains feeling as resulting from affections of the will in combination with conscious and unconscious ideas.—Ueberweg. Hist. Phil., vol. ii., p. 336.

† *Science of Language*, vol. i., page 389.

such crude sensation be apprehended by the mind—will now act somewhat similarly in reducing the violent photographic perspective which, save for the effect of plane projection, would resemble such crude perception very closely.

But this will not help us much when, instead of looking at the object, we look at its photograph; for such a sense of reality as we justly have when observing nature itself, is greatly wanting when viewing only its pictorial image. The larger the photograph, however, and the more accurate its details, the better is our sense of reality, for then we find more material for our inferences. But binocular vision, which aids this sense of reality in nature by continually suggesting a stereoscopic solidity, not only fails us with the photograph, but acts most energetically by forcing on us the fact that it is *merely* a plane surface we are looking at, not the depth and solidity of nature. Therefore we are now really helped by shutting one eye that we may fall under the illusion of perspective; and if, at the same time, we can adjust our monocular point of view to the true point of sight—the place of the lens which formed the image—a more pleasing perspective will commonly result, despite the forced and artificial mode of observation.

Since the above was written, I have seen Dr. Emerson's reply to my "Remarks." I will now only say that Dr. Emerson evidently did not notice that the completion of the sentence which he partially quotes—"that (distance) can never be apprehended as simple sensation *in the way that differences of colour, brightness, &c., are apprehended*"—shows that on the question of physiological or psychological theories of our sense or perception of *contrast*, I have followed Hering rather than Helmholtz. I understand him to admit the ignoring of what is—in England, certainly—a well-accepted theory, on the ground that he prefers the accepted theory of the sensationalists, though, at the same time, he attributes my apparent ignoring of their theory to innocence of their literature. I dare say Dr. Emerson has drunk deeper of their waters than I—individual preferences will influence our choice of reading. I wish also to seize this opportunity of saying at once, concerning the sentence which I said seemed "very like confusion of thought," that it has since occurred to me that it meant simply that photographic or camera-obscura measurements may prove fallacious to an artist, because not necessarily according with his visual perception. In that case I entirely agree. It is several years since I ever thought their identity could be relied on, and for that reason probably such a meaning did not at once occur to me.

---

The only difference between the professional and amateur, according to the *Fliegende Blätter*, is that "an amateur photographs people as they *are*, a professional as they would like to be."

Guard Against Light.—It can never be too urgently insisted that the greatest care should be taken in the dark room as to the light and the exposure of plates thereto. It is not, however, so much the quality of the light, but as to quantity, and its proximity or otherwise to the plate. It is infinitely easier to work with a fairly light yellow or ruby screen, and keep your plate and developing dish at a distance from it, than to have a very dark screen, and have to hold your dish close to and strain your eyes to gauge progress. In every instance where the negative is to be held to the light, it should first be well rinsed so that none of the developer remains on the plate during examination.—*Photographic Scraps.*

## ILLUSTRATION OF POEMS BY PHOTOGRAPHY.*

BY MISS CATHARINE WEED BARNES.

Delegates to political conventions are often said to be "instructed," and so I conceive myself to have been in receiving a notification that my paper for this Convention need not be long, and should be instructive. I shall endeavour to carry out these instructions.

Let me put myself on record, to begin with, as decidedly and understandingly taking ground that the words "art" and "artistic" are no longer the private property of painters and sculptors. After several years' training in painters studios I have largely laid aside the brush for the lens, and in so doing it appeared to me as if I was only stepping from one room into another, working with different tools and under different conditions, but imbued with the same reverence for art, and feeling the same inspiration. It is an undeniable fact that painters and photographers are apt to put on very defective glasses in judging each others' work, and a course of mental optics would benefit both in correcting far more serious aberrations than any to be met with in a photographic lens. Where one's attention is almost entirely given to portraiture, pure and simple, much of what might be called art in photography is not required, and would not be appreciated; but photographers justify the reproach that theirs is machine work when they allow themselves to sink into such a deep groove as only to see along the narrow path before them, while experience in painters' studios ought to liberalise one's judgment of a picture, whether made by brush or lens. There is often, however, great bigotry in much so-called liberality, and it needs a steady hand to hold an even balance in judging camera work now that it is worthily claiming a higher place in the judgment of the world than any heretofore given it. Neither the scientific nor artistic qualities should be exalted beyond their proper places. The lens has limits, and it is not a brush; yet, when those limits are fully understood, it will be seen that they embrace wonderful possibilities of their own. But as always, when one departs from the beaten track, this means hard work, a great deal of trouble, endless patience, severe art training, and a thorough understanding of what is meant by illustrating. I conceive this last to be a pictorial translation of an author's meaning, and that anything and everything which will tend to elucidate that meaning is justifiable. This remark is intended, as will be seen, to cover a wide field. The faintest conception of the true art spirit ought to keep one from making his pictures the stilted, ordinary, not-to-be-mistaken photographs. Push photographic limits as far as possible, refusing to be bound by the traditions of the portrait studio, and cutting loose from whatever can suggest it. Start with the intention to have all your accessories what they claim to be and where it is obligatory to use imitations, have them as perfect as can be made. Do not adopt the penny wise and pound foolish policy, or think it always needful to go to great expense in the studio, for a little ingenuity often goes a long way in devising useful contrivances. In many cases where I have been credited with expensive appliances the same have been made with my own hands, and, where unable to actually make the desired articles, I have designed them after long and careful thought. It is well to settle in one's mind, before taking up illustrative work, whether the object or the manner of realising it is the main point to be considered. If the latter, then, like the Irishman, stop before you

* Read at the Buffalo Convention.

begin, for you will not have enough enthusiasm to carry you over the inevitable discouragements ahead of you. Believe in and respect the dignity and beauty of the work; count no detail of the work as beneath your notice; use all the resources your taste and experience can suggest, and make everything give way to the definite purpose of obtaining a picture which will tell a story. Do not try to show the extreme limit of what can be done by a lens, but study simplicity, and avoid using more figures than are absolutely necessary. An artist with whom I once studied cautioned me against introducing figures into my paintings of interiors. "No matter how good everything else may be," he said, "people will pass it by and criticise the figure." Photography and portraiture have for so long been understood as synonymous terms that it seems difficult to believe the figure is not the first thing to consider, even in illustration. But such is not always the case, for, however effective the figure may be, the picture as a whole may often be ruined by some petty detail or incongruity. This is one reason why illustrations by photography are expensive to make when they call for correct rendering of historical costumes and surroundings. It is generally wiser to select subjects which allow simple and easily procured scenery, and which, in many cases, allow the work to be done out of doors even better than in the studio. Illustrations of out-door scenes ought to be made out of doors, and the light be subdued, if needful, by thin screens. As plenty of distance can be gained by this method, beautiful effects are often secured.

It is a great help to make a sketch of the intended picture, and decide where the figures will be placed, as well as all the accessories, before making an exposure, and study the effect of different colours and materials. Another good plan is to arrange everything except the figures, and make a preparatory exposure on the size and kind of plate, and with the same lighting you expect to use. I have known otherwise fine negatives lost by neglecting this precaution, finding after development that the plate was an old one, or was slower than ordinarily used in the studio. In this connection I should mention that professionals have told me they were often tempted to return to wet plates, as the dry plates, however good when fresh, could not always be relied upon, and were apt to fail when it was impossible to duplicate a negative. Looking at the picture from a painter's standpoint, it must be remembered whether you are supposed to take it indoors or out, by full daylight, or in the evening. Do not, if the scene to be represented would naturally appear dark in certain parts, seek to light it evenly, but think how a painter would treat it. This may lay you open to criticism from a merely photographic point of view, but you are not making a portrait. In the great paintings of such men as Rembrandt, parts of a picture are often in dense shadow, and in a painting that would not be criticised, but the same thing in a photographic picture would, nine times out of ten, be sharply condemned. This is unjust, for lens or brush would be useless if not inspired by a skilful brain, and it does not follow that a man can arrogate to himself the name of artist simply becauses he uses a brush, or deny it to one who recognises the future possible for camera work. It is always hard to live down a prejudice or a preconceived opinion, but there is a great deal of that to be done before art in photography is fairly recognised. As in a battle, the flag must be raised high over men's heads to enable it to be always in their sight, so the ideal in any line of human endeavour ought to be kept plainly before men, so that they shall continually grow and improve, and never feel that there are no more worlds to conquer; and the best thing about illustrative work is that one can never learn it all, for every victory makes a further one possible. Perhaps, and rightly enough, there is no quality more demanded in artistic photography than originality, though it is often supposed not to co-exist with technical excellence. Photographic training by itself is apt to form a stiff and artificial style, but it is not necessary, therefore, to assume that originality consists mainly of a violation of the rules of technique. The height of art is to conceal art, and to do this requires a thorough knowledge of technique. Photography has only begun to show what it can do in illustrative work, and its progress should not be made any more difficult than is inevitable from the unavoidable obstacles in its path. Demand always creates supply, and these obstacles will be gradually removed; but the attempts already made in this line of work should be judged by what has been done heretofore, and not by what we hope to eventually accomplish. Wiseacres the world over may shake their heads and declare that art is being lowered by the camera seeking to displace the brush, but the inexorable logic of events is an overwhelming force, and there is no use in fighting the inevitable.

It is not the part of wisdom to ignore difficulties, but to meet and overcome them, and the greatest genius must, in this work, be governed by certain fixed rules, labouring, so to speak, in harness. The poem selected for illustration should be almost learned by heart, thought of, brooded over, and dreamed about, until the fitting lines force themselves on one's consciousness. The famous painter, Da Vinci, was blamed by the prior of the monastery for which he painted that wonderful fresco of "The Last Supper," because he spent days in sitting before his work without touching it. But the figures and surroundings were, meanwhile, being evolved from his inner consciousness, and when he finally took up his brush no part of the picture needed correction. Let your mental vision see the picture as a complete whole before you even think of actually making an exposure. I believe, also, in testing my models in an ordinary portrait before posing them for the illustration, as sometimes an apparently good subject will prove a very poor sitter.

The exposure ought to be so nicely calculated as to leave but little work for the retoucher, but this depends largely on the sitter. It cannot be too often repeated that the retoucher should have some knowledge of facial anatomy, and realise that he is to labour over an intricate network of muscles and nerves, each affecting the expression, and not over a flat surface with nothing beneath it. It might be well to have a school for training models, as it is very discouraging, after securing an effective pose or a fine printing negative, to find your sitter has moved. It is almost impossible to use head-rests in work of this kind, and where 11 by 14 plates, or larger, are used, expense is something to be considered. It is incomprehensible to me, this utter inability of some people to face a lens, and where their nervousness or constant questions as to how they shall sit causes the loss of a good negative, it requires genuine Christian charity to "think no evil." My first unregenerate impulse is to decline the sitter's further service when, for instance, a pathetic scene is to be represented, and he or she seems possessed by an insane desire to be humorous. Painters are more fortunate in this respect than photographers, as their models are usually trained, and are not apt to offer advice as to how they take best, as if that had anything to do with the parts you intend them to portray. The operator who conscientiously tries to bring out the thoughts of a writer is under a keener nervous strain than the sitter can understand, unless he or she is a camerist.

I have learned to have the warmest sympathy for professionals, and when I hear people say "it is so tiresome to sit for a picture," always wish to say "yon don't begin to endure what the operator has to, and your work is over with the sitting; he is the oue to be pitied, and not you."

The possession or lack of the true histrionic instiuct of forgettiug self in an assumed character is at once revealed by the model when the operator disappears under the mysterious cloth. When only the keen-eyed lens confronts the sitter, it seems, to nervous persons, as a friend once said to me, as if the aforesaid eye was gazing iuto one's very conscience. The average sittter, whether willing to acknowledge it or not, is intensely self-conscious, which is the true name for what they like to call nervousness. They should, for the time being, merge Miss A or Mr. B in an assumed character, aud it is a discouragiug truth that if they cannot do this the picture will be a failure, no matter how fine the conception. Sitter and operator ought to be in perfect accord, and I do not find that there is much to choose as between men and women in sharing the above blame; oue is no more self-conscious than the other. Sometimes, indeed, models are so williug to please that they wish you to arrange every finger joint, or suggest to them the exact shade of expression needed, generally at the very moment you are placing the holder in the camera, or drawing the slide. I do not know which is the more difficult to manage.

The operator who poses the figures and designs the pictures should have nothing to do with the petty details of filling holders, placing them, drawing slides, aud moving things into position. The mere physical fatigue dampens one's enthusiasm, and it is absolutely important to have the nerves under control, and not be couscious of one's body.

I have said little about technical details or studio appliances, deeming that that would, indeed, be bringing coals to Newcastle, but would like to speak of a few points which have proved practically useful to me. No illustrative work should be undertaken with any but the best lens. A rapid rectilinear is, generally, preferable, but a wide-angle is often absolutely required, and I believe in either case in having it able to cover a larger plate than the one used, cutting sharp with full aperture. The studio scenery ought to be, as far as possible, in real, not simulated, relief; plastic, not painted. This allows the figures to be more naturally posed, and not so apparently on a line. Most of my scenery can be taken apart and re-adjusted, so that wheu used with different draperies, carpets, and furniture, it will form a number of combinations. With regard to the skylight, I have continuous sheets of ribbed glass, a little over an eighth of an inch thick. This is covered by five sets of white shades, divided into half-yard pieces running on wires from side to side. Over these are three sets of black shades divided and run the same way. The shades on the vertical light slide up and down. I use an ordinary view camera, as, with double holders, it permits more plates being ready before commencing work, and this is likely to save much time and trouble. Competition and exchange of ideas such as this present Convention, when used for the purpose of self-improvement and not mere display, ought to be of incalculable benefit, and the inspiration gained by the attrition of different minds constautly raises the staudard of photographic progress. In illustrative work amateurs and professionals can labour side by side, and each gain from the other. The former will learn to appreciate the almost infinite tact, patience, and hard work demanded of a professional, who, on his part, will learn that the intelligent amateur helps to elevate the work to which he himself has perhaps given the best part of his life, and thus, by mutually disseminating a wider and clearer knowledge of photography, gain for it more thorough appreciation and admiration.

## GLASGOW INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

### List of Awards.

Gold medal for special excellence, H. Van der Weyde.

*Professional.*—Class 1—Portraits (whole-plate and over), silver medal, W. M. Warnerke; bronze medal, W. W. Winter; extra bronze medal, G. Greül. Class 2—Portraits (under whole-plate), silver medal, H. Baker; bronze medal, W. J. Byrne. Class 3—Enlargement (portraits only), silver medal, H. Van der Weyde; bronze medal, T. and R. Annan and Sons. Class 4—Enlargement (other than portrait), silver medal, Alexander Brothers; bronze medal, T. and R. Annan and Sons. Class 5—Lantern slides, silver medal, G. W. Wilson and Co.; bronze medal, West and Son.

*Amateur.*—Class 6—Portraits (whole-plate and over), silver medal, Prince Ruffo; bronze medal, C. B. Moore. Class 7—Portraits (under whole-plate), silver medal, no award; bronze medal, W. J. Jenkins. Class 8—Enlargement (portrait only), silver medal, no award; bronze medal, W. H. Kitchin. Class 9—Enlargement (other than portrait), silver medal, R. H. Elder; bronze medal, W. S. Anderson. Class 10—Lantern slides, silver medal, J. E. Austin; bronze medal, A. Watson, A. Pringle. Class 11—Landscape (whole-plate and over), gold medal, D. R. Clark; silver medal, H. P. Robinson, A. H. Hinton; bronze medal, J. G. Pratt. Class 12—Landscape (under whole-plate), bronze medals, J. A. C. Ruthven and Mrs. Janie N. Hignett. Class 13—Marine and clouds, silver medal, no award; bronze medal, C. Millard. Class 14—Animals, silver medal, J. Catto; bronze medal, C. Reid. Class 15—Out-door groups, silver medal, Karl Gregor; bronze medal, F. Bremner. Class 16—Architecture, silver medal, no award; bronze medal, C. V. Shadbolt. Class 17—Interiors, silver medal, C. Court Cole; bronze medal, W. J. Byrne. Class 18—Still life, no award. Class 19—Flash-light, silver medal, John Stuart. Class 20—Instantaneous, silver medal, W. S. Anderson; bronze medal, H. Symonds. Class 21—Hand-camera (seaside and marine), silver medal, J. W. Wade; bronze medal, A. Watson. Class 22—Hand-camera (other subjects), silver medal, W. S. Anderson; bronze medal, R. H. Elder. Class 23—Stereoscopic transparencies, silver medal, W. S. Anderson; bronze medal, F. McKenzie; Class 24—Genre, silver medal, H. P. Robinson; bronze medal, J. Terras. Class 25—Scientific, silver medal, R. Kidston; bronze medal, W. H. Howie.

Champion class.—Portraits—Gold medal, W. Crooke; other than portraits—Gold medal, L. Sawyer.

Lady amateurs' class, silver medal, Mrs. B. G. Bennetto; bronze medal, Mrs. J. N. Hignett.

Silver medals awarded for exhibits of special merit—R. W. Robinson, Countess Loredana da Porto.

Photo-mechanical section—Silver medal, Boussod, Valadon, and Co.; bronze medals, Richard Paulussen, T. and R. Annan and Sons, Photo-chrome Engraving Co. of New York, S. B. Bolas and Co.

Apparatus—Bronze medals, W. Middlemiss, George Mason and Co., James More and Co., J. Lizars, W. Watson and Sons.

A Photographic Actress.—Mr. Henry Irving and Miss Ellen Terry, says the *Echo*, are now staying at North Deal. Miss Terry, it is not generally known, has mastered the art and mystery of photography, and, fortified with a camera, the most popular of actresses relieves the monotony of her professional "rest" by turning her lens upon every agreeable object within view. While Mr. Irving strolls along Deal Beach, Miss Terry is taking the likenesses of Deal boatmen. She manages her plates and black bag like an old photographic hand.

## Notes.

A large number of cameras are to be seen this year at every seaside resort, and although the greater proportion of these are in the hands of amateurs, a professional worker can often be detected amusing himself in this way. Few photographers, we fancy, go out of town without the means of taking a picture or two whenever they may feel inclined to do so, and many a time have we come upon some veteran in the art whiling away his holiday time in this manner.

One whom we lately met was intent upon photographing that which he enthusiastically called "one of the most beautiful things in the whole realm of nature." He alluded to a seagull in flight, and in searching for his quarry he adopted a device which he had, with the greatest disgust, seen practised by a cockney sportsman. This unworthy individual had gone out in a boat with a gun and several huge hunks of bread as bait. The bread he cast upon the waters in a literal sense, and as soon as the poor birds collected and hovered over it he blazed away at the beautiful creatures, apparently for the mere pleasure of killing, for the birds are useless for edible or any other purposes. Our friend, as we say, took a hint from this wanton practice, and fired at the birds with his hand-camera. The results he obtained were very beautiful, and, we venture to say, gave him far more pleasure than could ever be felt by the cruel sportsman from whom he borrowed the idea.

But the dismal weather which has been the remarkable feature of the present year has interfered sadly with the operation of photographing seabirds, or any other thing outside the studio, and the saving in unused plates must in the aggregate represent a great loss to the makers and dealers. The continuance of dull weather, which culminated the other day in London in a real November fog, has also been disastrous to photographic pursuits by making printing operations a very weariness of the flesh. It is said that September is to be a sunny month, but weather prophets are seldom to be believed in, and never seem to take heed of the American humourist's axiom which advises all men not to prophesy unless they *know*.

A new use has been found for portraiture, and, as it is in connection with industrial strikes, photographers may hope for an increase of business, for strikes seem to increase in number as the years roll by. The fact came out during certain proceedings at the County of London Sessions the other day which had for their origin the practice of picketing in connection with the carpenters' strike. It was stated that the picketing had not ceased, and in order to further its ends, a photograph of one of the witnesses for the prosecution was being circulated among the picketers so that he should be a marked man. In times gone by a man was marked by branding, having his ears slit, or in some other uncomfortable fashion. The photograph is far more effectual, for it is not attached to his body, and therefore cannot be hidden, while the mutilation can be more conveniently carried out subsequently.

Mr. Harry Furniss has not escaped the interviewer. Through the medium of the latter, we are told that Mr. Furniss thinks a caricature a much better likeness of a person than a photograph, as a photograph loses everything a caricaturist seizes and catches. For this Mr. Furniss blames the sitter quite as much as the artist or the photographer. They claim and are content with a mere conventional presentment of themselves with all the characteristics left out. This argument, at first sight, seems to be convincing, but is it really tenable? Mr. Furniss is a photographer as well as a caricaturist, and we shall be much surprised if he seriously contends that it is possible for a photograph to possess the essential quality of a caricature—namely, exaggeration. A caricaturist has an advantage over a photographer in being able to pick and choose his subject, and we may be sure he will never pick one which has no points he can seize upon. Gladstone with his collars, Harcourt's double chin, Randolph Churchill's moustache (when it existed), Sir Richard Temple's extraordinary nose, Sir Robert Peel's wonderful hat, with its curly brim, and his facial adornments—how easy to caricature such material! How difficult with the expressionless visages of Mr. John Morley, Mr. Parnell, or Sir Charles Dilke! The comparison between photography and caricature is not a fair one.

The *Daily News* and the *Court Journal* have each quoted the note which appeared a fortnight ago in these columns referring to the low standard of art represented by the portraits published by the evening and weekly newspapers. The *Court Journal* has, however, made us say that we are "not aware of the difficulties which surround newspaper portraiture," which is rather an unfortunate mistake, as what we did say was exactly the reverse.

We have not yet heard of the Holy Coat of Trèves being photographed, but it would not be surprising if some enterprising amateur tried his hand at it. As a business speculation it would pay handsomely, for photographs of relics of this nature find a ready sale among devotees. Unfortunately these relics are not, as a rule, exposed to the searching light of the sun, but are kept in such a dim religious seclusion that snap shots with a hand-camera are out of the question. The clergy of Trèves, according to the newspaper reports, do not disdain to turn an honest penny in the way of selling rosaries, tracts, and pictures of the Holy Coat, much to the disgust of the shopkeepers, who complain bitterly of the competition. Anyone who could offer photographs would, consequently, be largely patronised.

Despite the enormous increase in the consumption, and consequently price, of platinum, the source of supply remains exactly where it has been for many years past—the Ural Mountains in Russia. Platinum is to be found in other parts of the world—for instance, in California and Southern Oregon—but, according to the *Mining and Scientific Press*, of San Francisco, it has not hitherto paid to extract. At present prices, however, it should yield a profit. Platinum is chiefly found in connection with what is called gold placer mines, that is to say, where the gold is found in conjunction with gravel, and is obtained by hydraulic operations. The *Press* says, "At the advanced price now ruling, miners who are engaged in surface workings should look after their platinum closely, and save all they can." An increase in the supply would no doubt reduce the price slightly, but not so much as to affect materially the advice given by our San Francisco contemporary.

## PHOTOGRAPHY AT THE THEATRE.

THE *Photo Gazette* publishes in its last number an unusually fine collotype reproduction of a flash-light picture taken at one of the Paris theatres by M. Roger, of Nancy, who used a flash-lamp constructed by M. Boyer. The picture includes about seventy figures grouped on the stage during the performance of the successful play entitled *Le Régiment*.

In the course of an article which accompanies this illustration, the writer (J. Mareschal) points out that the apparatus sold for the purpose of producing the magnesium flash is of endless variety, but, as in most other things, the simplest of them are the best. He also asserts that magnesium powder is often adulterated with foreign material, notably with zinc, which, of course, burns with far less brilliance than the metal which it supplants. It is recommended that buyers should prepare the magnesium powder for use by passing it through a sieve made of silk tammy, rejecting the coarser particles, and employing only those which resemble very fine dust. Above all things, it should be used as pure as it can be obtained, and certainly not mixed with chlorate of potash. This mixture, which possibly gives a more brilliant light, is dangerous to handle, and may cause serious accidents. Moreover, there is produced during its use a far greater body of noxious vapour than when the metal is employed alone. With the ordinary flash-lamp sold for amateurs' use it is not advisable to cover too large a plate. The sizes 9 by 12, or, at the outside, 13 by 18 (centimetres), should not be exceeded. The mode of operation is very simple. The picture may be focussed with a taper, which, when moved from side to side, will show on the ground glass screen the limits of the picture to be taken. When all is ready, the shutter of the dark slide may be withdrawn. In the meantime, the gas or other lights of the place may be left burning, provided

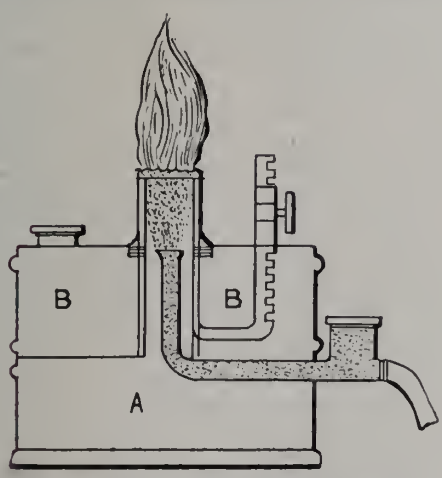



*Fig.* 1.—A, air chamber; B B, reservoir for alcohol.

none of them is in the field covered by the lens. The lens cap is not removed until the moment is at hand for firing the magnesium charge, and the lens should be covered again immediately after that operation.

If a picture of greater dimensions than those stated is required, a battery of lamps must be employed instead of a single one, and with this object M. Boyer has adopted a system the effectiveness of which is proved by the excellent results shown in the picture to which we have already called attention. It must not be thought that this picture is a mere fluke, a happy accident, for this is not the case, several theatrical pictures having been taken which, we are told, are quite as good. These pictures will presently be published by the firm of Dentu in the form of a highly interesting album.

The operator places his camera either in the middle of the orchestra stalls, or in the dress circle, according to

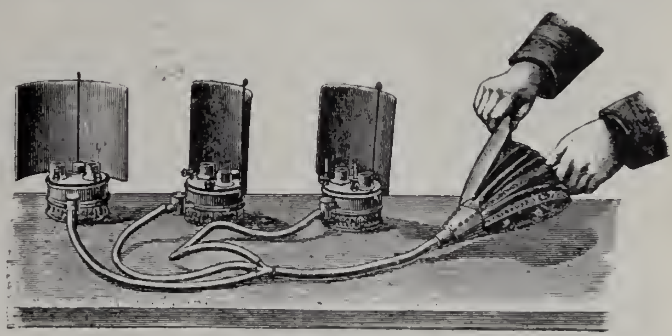


*Fig.* 2.

the size of the proscenium opening and the auditorium. The flash-lamps are placed close to the scene in front of the first tier boxes, right and left.

The lamp is one which burns alcohol with annular wicks, in the middle of each of which protrudes the pipe through which the magnesium dust is urged into the flame. The annexed cut (fig. 1) will sufficiently explain its construction. But this sectional cut shows only one wick, its object being to give relation of parts only. In fig. 2 it will be seen that each lamp has two wicks, and each of these has its separate supply of magnesium dust, although only fed by one air supply pipe. It will be seen that any number of these lamps may be joined together by india-rubber tubes, and these again by means of a main pipe connected with a pair of ordinary household bellows. The india-rubber tubes should be of a uniform length, in order that ignition may be simultaneous in all the lamps, producing one great flash. It is also necessary that the subjects to be photographed should be motionless, for although the flash is as rapid as possible, it is not absolutely instantaneous. Indeed, the light may occupy half, and in some cases a whole second of time. The art of the operator consists in the judicious disposal of his lamps so that few shadows are cast, and in exercising his judgment in making the light stronger on one side of the composition than on the other.

---

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.—The next meeting will be held on Tuesday, September 8th, when papers on "Printing Processes" will be read, and demonstrations given by the following members:—Dr. A. Hamilton, "Platinotype"; Mr. J. T. Lees, "Alpha Paper"; Mr. J. Drinkwater, "Chloride Paper."

THE following advertisement recently appeared in a German photographic paper:—"A born gentleman, 38 years old, of medium stature, heretofore an independent office-holder, but not altogether satisfied with his situation, amateur photographer and crayon portrait sketcher, seeks, from pure love of the art, a pleasant, wealthy lady (widows not excluded, nor is age material) who is in possession of a large photographic establishment, for the purpose of marrying the same. Honest proposals, including photograph, to be sent to 'A. B. C.,' 3149, care publication office, Düsseldorf, Germany."

## THE DECOMPOSITION OF SILVER CHLORIDE BY LIGHT.*

BY A. RICHARDSON, PH.D.

*Examination of the Darkened Chloride for Oxygen.*—The question whether the darkened compound is an oxychloride or a subchloride of silver appeared to be best decided by a careful examination of the compound for oxygen. The first experiments made in this direction consisted in heating the dry, darkened product in a vacuum, and collecting any gas which might be given off. 26 grams of pure silver chloride, which had been exposed to light under water until it had lost 8 per cent. of its total chlorine, was dried at 110°, and placed in a hard glass tube closed at one end, and connected at the other with a Sprengel pump; after the tube was exhausted, a graduated tube containing mercury was inverted over the turned-up end of the fall tube of the pump, in order to collect any gas which might be given off on heating. On gently warming the tube containing the chloride, it was found that just at first small quantities of gas were carried over; when gas ceased to come off, the temperature was raised and kept at the melting point of the chloride for about half an hour, during which period no further gas was evolved. The total volume of gas collected = 0·6 c.c.; this was proved to be air contained in the powder and on the glass, for, on shaking with alkaline pyrogallol, only a minute contraction of about 0·1 c.c. took place.

In a second experiment, 20 grams of the darkened chloride, from which 7 per cent. of the total chlorine had been removed by exposure to light, was heated as in the previous experiment; in this case, also, a minute quantity of gas was given off, which measured 0·4 c.c. at 0° and 760 mm.

It appears from these results that if oxygen is present in combination with the darkened chloride, it is not given off at the melting point of the silver chloride with which it is associated.

The next experiments were made to determine whether water was formed when the darkened product was heated in pure hydrogen. The gas, which was prepared by the action of steam on metallic sodium, was first dried by passing it through tubes containing sulphuric acid, then led over metallic copper heated to redness, and, finally, the last traces of moisture were removed by means of phosphorus pentoxide. The gas so obtained was passed into a combustion tube, in which the darkened chloride was to be heated. This tube was drawn out at one end and terminated inside a bulb, which was connected with a weighed phosphorus pentoxide tube, the escaping gas then passing through a second drying tube, and finally into a bulb containing water, in which the hydrochloric acid was absorbed.

That phosphorus pentoxide does not absorb dry hydrogen chloride to any appreciable extent (when exposed to the gas for a few hours only) was proved by the fact that the gain in weight of such a drying tube, after being exposed to the action of hydrogen chloride for 3½ hours, was only 0·003 gram, and that, on again passing the gas for two hours, no further increase in weight could be detected.† Tubes which had been exposed to the action of the gas till the weight remained constant were used in the subsequent experiments. Before heating the darkened silver chloride in hydrogen, the combustion tube was exhausted and gently heated until the air adhering to the glass and pulverised chloride had been removed; the tube was then heated in the current of hydrogen, the temperature being gradually raised till the chloride began to show signs of fusing. It was important, however, that the temperature should not rise too high, as the hydrogen chloride formed was found to act on the glass, carrying over small quantities of calcium chloride, which possibly (in one case) reached the weighed phosphorus pentoxide tube. The reduction, which lasted from seven to eight hours, was found to be complete when the escaping gas failed to give any turbidity with silver nitrate.

The results are given of four experiments made in the manner described. In the first three the darkened chloride was obtained from silver chloride from which 8 per cent. of chlorine had been removed by the action of light. In the last experiment, pure silver chloride was reduced in order to determine how far the gain in weight in the phosphorus pentoxide tube was due to experimental error. In the second experiment the tube had been strongly heated, and it was most probable that a trace of calcium chloride was carried over.

TABLE V.

| Weight of darkened chloride taken. | Gain in weight of $P_2O_5$ tube. |
|---|---|
| (1) 24·64 grams | 0·00375 gram |
| (2) 22·35 ,, | 0·00475 ,, (very strongly heated) |
| (3) 24·24 ,, | 0·00325 gram |
| (4) 13·0 ,, (normal chloride) | 0·00250 ,, |

From these experiments, it will be seen that the increase in weight in the phosphorus pentoxide tubes is so small as to preclude the possibility of the presence of an oxygen compound of silver in the darkened chloride.

In conclusion, it may be mentioned that, as a further proof of the absence of oxygen in this substance, an experiment, which is a modification of one described by Carey Lea (*Amer. J. Sci.* 38, 356-361), was made. Silver chloride was dried with extreme care and placed in a tube containing pure, dry carbon tetrachloride, from which all air was expelled by boiling. On exposure to light the chloride rapidly darkened, although it was certain that no oxygen was present.

* Continued from page 605.

† Dry air was drawn through the tubes before weighing.

CHAMOIS SKINS.—Considering what a useful thing a chamois skin is, it is astonishing that there is so much ignorance as to the proper way of keeping it in order and lengthening its term of service. Chamois skins should never be left in water after being used, but should be wrung out and hung up to dry, being spread out carefully so as to leave no wrinkles. They should not be used to wipe off colours, as paint stains form hard spots, and make the skin wear out sooner. Chamois was never intended to wipe the face and hands with, which makes the skin become greasy. Never put a chamois skin into warm water; anything above lukewarm water will curl it up, making it become thick, tough, and useless. To bring back chamois that has been injured by grease and paint, or used as a towel until it resembles a dirty old rag, the following is recommended: Take a bucket of clean water which has been made fairly but not too strong with ammonia; soak the skin in it over night, and the next morning rinse it out in pure water, after which use pure white Castile soap and water freely. The whole operation, aside from the soaking, need take no longer than a quarter of an hour, and it makes the skin in reality better than it was before, having freed it from all impurities.—*The Optician.*

THE September issue of *Die Photographie*, in an appreciative notice, announces the death of Emanuel Mariot (Schielhabl), at the age of sixty-six.

## ROYAL CORNWALL POLYTECHNIC EXHIBITION.

The fifty-ninth annual exhibition of the above Society was opened on Tuesday, August 25th, at Falmouth, by the Right Hon. Leonard Courtney, M.P., the President, whose three years' term of office expires this year. There was a large attendance of residents and visitors, but owing to the rain many who would have attended were kept away. The address of the President was listened to with great attention. He referred to all the departments—viz., mechanics, mining, fine arts, photography, &c.

Lectures, concerts, and addresses were given during the week, but the rain, which prevailed for the greater part of the time, very much thinned the attendance in the hall.

On Thursday evening Mr. W. Brooks, of Reigate, gave a lantern entertainment, the subject being "The Tower of London," with lecture, followed by a few pictures of the State apartments of Windsor Castle, taken during the Jubilee, and concluding with some statuary. The lecture was ably given by Mr. J. F. Peasgood, of London; and although the evening was so wet, the hall was packed. The lenses used were made by Messrs. Taylor, Taylor, and Hobson, of Leicester, for the occasion, and did their work well, giving an exceedingly sharp picture. The chair was taken by Mr. W. N. Carne.

The Art Union Drawing took place on Friday at 9 p.m. Notwithstanding the bad weather, the attendance was a little in advance of last year.

### Judges' Report—Photographic Department.

The Judges have pleasure in making the following report to the Society:—

Whilst the number of general exhibits is not quite equal to last year, there is no falling-off in the excellence of the work shown. In the professional section, landscapes are again, as last year, few in number. Portraiture, however, is exceedingly well represented, especially by our old exhibitors, whose names are well known by this time. By far the greater number of pictures are printed in platinum. The amateur section is well represented in the several classes, and in many cases show a distinct advance upon former attainments. There are also several exhibits of importance in the photographic appliance and lantern section.

*Professional Section.*—For interior work Mr. F. W. Edwards, of Peckham, takes first silver medal for his view of the nave of Westminster Abbey, which shows high technical excellence. Mr. and Mrs. Anckorn have two genre pictures, which are gems in their way. Mr. Gulliver Speight sends two skating scenes. Mr. Lyd. Sawyer, of Newcastle, is again well represented, but he had evidently overlooked the fact that some of his pictures had been previously shown here. For his humorous picture, "Two's Company," he has been awarded a second silver medal. Messrs. Green, Cross, and Bevan send some curious examples of photographic printing on silk, and also some transparencies on celluloid and glass, the latter being very poor. Mr. J. Milman Brown shows some landscapes, chiefly in the Isle of Wight. Mr. Clarence James has a frame of studies of dog and child, which are clever in arrangement, and tell their own tales. Mr. W. Rooke sends an enlargement, which would have been better if it had been taken direct. Mr. Henry Reeves is represented by three examples of interior work, which are soft and delicate. Mr. Bradshaw sends two portraits of the same child. Mr. W. D. Welford has been awarded a second bronze medal for transparencies. Mr. R. W. Robinson, of Redhill, shows good work in several classes, and his late pupil, Mr. S. N. Bhedwar, sends portraits of a luxurious type. Mr. J. P. Gibson, of Wrexham, takes the award for landscape with his small picture "When the Day Burns Low," viz., first bronze medal. Mr. S. J. Barrett, of Manchester, has a case of half-a-dozen portraits printed in silver. Landscapes are also treated by Mr. Hendry and Mr. Joseph Smith, which show careful work. In portraiture, the judges had some difficulty in making their award between Mr. W. W. Winter, of Derby, and Mr. W. J Byrne, of Richmond, as each seemed to have attained the highest point of excellence, the one in his well-known sepia tones (platinum), and the other in silver printing. They therefore in justice have been obliged to award a first silver medal to each. These two exhibitors have also various other works well worthy of inspection. Mr. Westley J. Fry this year enters in the professional section for enlargements, instead of as last year in the amateur section.

*Amateur Section.*—Mr. H. Tonkin, of Penzance, carries off the first bronze medal for an enlargement of "Mousehole Pier and Boats," which is a highly creditable work. The Rev. H. B. Hare is awarded a second silver medal for his meritorious picture "The Taker Taken." Mr. Ernest Beck, of Sheffield, sends a series of landscapes and river scenes, in platinum, which are decidedly artistic. Mr. A. K. Gillespie exhibits a small series. "The Stepping Stones" of Mr. T. B. Sutton, of Liverpool, is a picture of careful treatment. For genre work Mr. A. G. Tagliaferro takes first bronze medal, and his six pictures form a highly interesting collection. A view of the interior of Christ Church, Oxford, secures a first bronze medal for Mr. C. Court Cole. Mr. A. R. Dresser is represented by several enlargements. Mr. E. Austin secures first bronze medal for his picture denominated "Chaff," a work of instantaneous character. Mr. G. Soltau Symons sends specimens of divers methods of printing from the same negative. For "The Tomb," the Rev. G. E. Hermon receives a second bronze medal. Mr. H. Dudley Arnott exhibits a frame of interesting subjects. Six quarter-plate prints are shown by Mr. Victor J. Hatfield, printed in silver. Four transparencies are shown by a beginner, Miss Rachel Barclay; and some similar work by Mr. J. Richards, of Newlyn, Penzance. Dr. Campbell shows some instantaneous studies, but owing to their not being framed they are disqualified. It would not be right to omit to mention the splendid series of enlargements from the negatives of Mr. Sherring of botanical subjects, which, though growing in the neighbourhood of Falmouth, are of a tropical character, and the series cannot fail to be of great value to the student; they show great skill on the part of Mr. Sherring.

### List of Awards.

*First Silver Medals.*—F. W. Edwards, W. W. Winter, W. J. Byrne.

*Second Silver.*—Lyd. Sawyer, Rev. H. B. Hare.

*First Bronze.*—H. Tonkin, A. G. Tagliaferro, C. C. Cole, J. P. Gibson, E. Austin.

*Second Bronze.*—W. D. Welford, Rev. G. E. Hermon.

In the photographic appliance section, the awards are deferred until after trial.

## PHOTOGRAPHIC CHEMISTRY.*

BY PROFESSOR R. MELDOLA, F.R.S.

Apart from the popularity of photography as an inexpensive amusement, enabling the amateur to obtain, with comparatively simple appliances, permanent records of places visited, or representations, more or less faithful, of the features of those whose individuality it is wished to bear in remembrance, the subject is becoming of daily increasing importance, on account of the numerous applications which photographic processes have found, both in art and in science. For this reason, it is desirable that the claims of photography to be considered a distinct branch of applied science or technology should be urged upon all those who are in any way interested in the advancement of technical education. Some progress has already been made in this direction in certain schools and colleges in this country, but when our efforts are compared with the keen appreciation of the subject which is borne witness to by the splendidly equipped photo-chemical laboratories of the technical high schools of Berlin and Vienna, it will be admitted that in this, as in other departments of chemical technology, we have allowed ourselves to sink into a secondary position. It is certainly remarkable that the land of Fox Talbot and Herschel—the country which has given to the photographic world all the most important processes discovered since the foundation of the art by Niepce and Daguerre†—should nowhere possess a school of photo-chemistry where the subject can be taught from a scientific platform, or where original investigators can find the requisite appliances and the skilled assistance necessary for the prosecution of research.

Setting out from the admission that photography must, sooner or later, become incorporated in all schemes of systematic instruction in applied science, I propose, in the present course of lectures, to show how this subject may be dealt with from a chemical point of view. From this it must not be inferred that photography is to be regarded purely as a branch of chemical technology, for it has also its physical side, and the highly trained photographer should be well grounded in the theory and construction of lenses, spectrum analysis, and, in short, in the general principles of optics. Assuming this knowledge to have been acquired, we may proceed to ask how the subject is to be taught, and the consideration of this question is of considerable importance—it is, in fact, of far greater importance than may appear at first sight, for photography is most admirably adapted to bring out into prominence the principles of technical instruction in a subject which is very largely of a chemical nature. The consideration of this question may help to dispel some of the haze with which the much-abused term "technical training" has been surrounded, and it will certainly lead to a clear conception of the object and scope of these lectures.

There are many who identify technical instruction with the teaching of some handicraft, a notion which has, no doubt, arisen from the identification of technical skill with manual dexterity in some mechanical industry. By the adoption, either tacitly or openly, of this narrow definition, the chemical industries have suffered to a very large extent in this country, because their progress is more dependent on a knowledge of scientific principles, and much less dependent on manual dexterity, than any of the other subjects dealt with in schemes of technical instruction. Now, in order to give technical instruction in a subject like photography, which is so intimately connected with chemistry, we may adopt one of two courses: The student may become a practical photographer in the first place, and may then be led on to the science of his practice by an appeal to the purely chemical principles brought into operation. This may be called the analytical method. The other method is to give the student a training in general chemistry first, and then to specialise his knowledge in the direction of photography. This may be regarded as a synthetical method.

In other departments of technology, and especially in those where the underlying principles are of a mechanical nature, the analytical method may be, and has been, adopted with success. It is possible to lead an intelligent mechanic from his every-day occupations to a knowledge of the higher principles of mechanical science by making use of his experience of phenomena which are constantly coming under his notice. From this it is sometimes argued by those who are in the habit of regarding technical instruction from its purely analytical side, that technical chemistry can be taught by the same method. Some teachers may possibly succeed in this process, but my own experience, both as a technologist and a teacher, has led me to the conclusion that, for chemical subjects, the analytical method is both too cumbersome and circuitous to be of any real practical use. No person engaged in chemical industry in any capacity—whether workman, foreman, manager, or proprietor—can be taught the principles of chemical science out of his own industry, unless he has some considerable knowledge of general principles to start with. No person who is not grounded in such broad principles can properly appreciate the explanation of the phenomena with which his daily experience brings him into contact, and if his previous training is insufficient to enable him to understand the nature of the changes which occur in the course of his operations, he cannot derive any advantage from technical instruction. These remarks will, I hope, serve to emphasise a distinction which exists between technical chemistry and other technical subjects, and I have thought it desirable to avail myself of the present opportunity of calling particular attention to this point, because it is one which is generally ignored in all discussions on technical education.

The reason for this difference in the mode of treatment of chemical subjects is not difficult to find. The chemical technologist—the man who is engaged in the manufacture of useful products out of certain raw materials—is, so far as the purely scientific principles are concerned, already at a very advanced stage, although he may not realise this to be the case. The chemistry of manufacturing operations, even when these are of an apparently simple kind, is of a very high order of complexity. There are many branches of chemical industry in which the nature of the chemical changes undergone by the materials is very imperfectly understood; there is no branch of chemical industry of which the pure science can be said to be thoroughly known. For these reasons I believe that I am justified in stating that the chemical technologist

* Cantor lectures, delivered at the Society of Arts Theatre.

† This is no vain boast. Taking the discoveries in order, we have the silver print and chromatised gelatine emanating from Fox Talbot; the cyanotype due to Sir John Herschel; the collodion process introduced by Scott Archer and Fry; collodion dry plates by Russell; printing with pigmented gelatine worked out by Swan; gelatino-bromide emulsion introduced by Maddox; and the platinotype process of Willis; to say nothing of the photo-mechanical printing processes, such as Woodburytype, to which English investigators have contributed so largely.

is working at a high level, so far as the science of his subject is concerned, and this explains why he cannot be dealt with by the analytical method.

*(To be continued.)*

## ART IN PHOTOGRAPHY.*

BY G. HANMER CROUGHTON.

Many years ago (it was during the carte-de-visite rage) I was painting for a firm of photographers in Dublin, Ireland. Being in the reception-room one morning, I heard the principal of the establishment arguing with a sitter who did not like her portraits; he was trying to convince her that the portrait must be right, because the instruments he used being the very best, it was like standing before a looking-glass, and there would be as much sense in complaining about the reflection she saw in her mirror as in doing so with her portrait. The sitter answered the photographer by a question which completely silenced him. She said: "If that is true, what makes the difference between good and bad photographers?"

This is my text: "What is it that makes the difference now more than then?" I answer emphatically, the presence or absence of art. The presence or absence of art-knowledge or taste in the photographer makes the difference in the photographs made in his studio—makes the difference we see in the productions exhibited year after year at the exhibition of the Photographic Association of America.

In the early days, when little or no art was practised by photographers, the public were not so exacting, because, being ignorant themselves, they did not look for it. The difference consisted mostly in the chemical manipulations. Keeping the silver bath in order, keeping that and the collodion and developer in harmony, that each should work at its best in relation to each other, kept the operator busy, and left little time for the artistic. How many times has it happened that, while the operator was trying to get his sitter nicely arranged, his plate would dry, and so spoil his chemical effect? Is it much wonder, then, that the artistic gave way to the chemical? All honour to those photographers who in the wet plate days produced artistic photographs as well as good chemical effects.

Whatever the dry plate may be blamed for—and you cannot read a photographic journal without finding almost all the sins in the calendar attributed to it—there is one thing it has done for photographers, and that is, it has given them time to study for artistic effects of lighting and pose without the fear of spoiling their chemical effect, and by rapidity of exposure has enabled them to aim for expression, the soul of portraiture.

Some croakers claim that the glue plate—as the late Mr. Gregg, of this city, called them—has reduced photographic manipulations to a dead level, and that any "duffer" can now produce good negatives; if this is so—and I confess there is some truth in it—there is but one way to excel, and that is in the artistic.

Photographers have got to learn about art both inside and outside their studios. What I mean by that is, that photographers as a rule, even those who are known as artistic photographers, are too apt to study art through the one eye of their cameras, instead of studying it through the two eyes in their heads. They get so used to the photographic rendering of certain effects of colour, light, and shade, that they forget to look at them with the eyes of an outsider, and get to regard the photographic rendering as right because the lens and camera produced it so. It would be well for every photographer who wishes to keep ahead to join some art class or school, and study art independently of photography, as well as studying those books which are devoted exclusively to art photography, and to learn to look at it from an outsider's point of view.

This advice will, I know, be particularly irksome to Americans, who always want to go the quickest way to work, and who, unless they see some immediate advantage in it, will not care to try it. But, although the saying may be a chestnut, it is a sound and good one, that there is no short or royal road to knowledge, and experience must be gained by long and often irksome effort.

To see nature with the eyes of an artist who has been trained to see her as she is, is very different to seeing it through the lens in a photographic skylight. I have often heard photographers laugh at the efforts of artists to light a sitter in a photographic skylight, and their sneers at the failures made by them is natural enough, but it should cause thought on the part of the photographer as to the WHY ——?

The light in an ordinary photographic skylight is a very trying one to almost every sitter, and is the cause in nine cases out of ten of a strained or painted expression. An artist, when sitting a model to paint from, uses very little light, and the effect upon the sitter is better in many ways; the pupils of the eyes are larger, and the expression in repose. Let the photographer watch the lighting of the faces of his friends in an ordinary room, and if he has any discernment he will see at once the difference in the quality of the light and its influence upon the faces and expressions; he will also note that in an ordinary room the roughness of the textures is not noticed. But get those same faces under the photographic skylight, and on account of the volume of light the pupils of the eyes contract and the eyelids close together, which causes the constant complaint that the eyes in a photograph always look smaller than in nature. Seeing this effect in all their sitters, photographers have come to believe it is right, and treat with disdain the objections of the sitters and their friends, who miss the every-day expression, and see only a new one, which they cannot account for.

Another thing which has become so familiar to photographers that they have ceased to think it a defect is the exaggeration of the skin texture. When I was a student, the instructor of the life-class called our attention to the fine, short down all over the face of the model; then, taking us far enough away to lose the details of the skin texture, he pointed out how that down which we could not see gave a general soft blending of tints and shadows without getting any of the roughness of texture. He concluded by saying: "At best a microscopical study of the human mask would be an unpleasing curiosity." Now, it would appear as if some photographers thought this unpleasant curiosity was the right thing to get, and they will not only use a rectilinear form of lens for large portraits, but will stop down till the texture of the skin in the negatives is much more like what is seen through a microscope than the human skin seen at a moderate distance. Another cause of exaggeration of texture is in the lighting. The so-called Rembrandt or edge lighting will exaggerate texture out of all truth, and when to that is added microscopic sharpness, then truth and art are shut out. Do not think I am an advocate of out-of-focus fuzziness. I am opposed to extreme sharpness where that sharpness is at the sacrifice of truth to nature.

At the Convention at Boston there was an exhibit which

* Read at the Buffalo Convention.

attracted the attention of all; I think it was from Germany. They were portraits about 11 by 14, mostly heads, printed upon matt surface paper of some kind. I saw a great deal of them, and studied them with the greatest interest and profit. They were admired by all the best photographers who attended the Convention, not one of whom but gave them unqualified praise. They were certainly not sharply focussed according to the usual photographic standard, yet they were sharp enough for pictorial standards, and their great beauty was their truthfulness to nature. The retouching upon them was only just enough to remove the spots and blemishes due to the false rendering of colour by photography.

This is another abuse which has done much to bring photography under condemnation from artists: over-retouching. You must do it when you make such extremely sharp negatives, particularly when you make large heads. The photographic texture is an exaggeration of the natural texture, and the pencil of the retoucher must be used; and in getting rid of this exaggerated texture, the retoucher makes with his pencil another which is more unreal in its mechanical smoothness than the exaggeration of extreme sharpness. If you will use a portrait combination and do not stop down too closely, and use a diffused, subdued light, these exaggerations will not be seen, the retoucher's work will be much lighter, and you will have a consequent gain in truth.

From what I have seen of the new isochromatic plates, they are going to make quite a revolution in both lighting and retouching. I have not used many of them, but I am quite charmed with what I have. The breaks in the gradations of the shadows, caused by the false rendering of colour, are absent entirely, and the retouching reduced to a minimum. The texture of the skin is softer and more truthful, and the general effect so superior, that before long they must take the place of all others. One of the best firms in the city is using them exclusively, and speaks in high terms of them.

I have confined my remarks to suggestions; to write exhaustively would be out of place where there are so many other things to attract your attention. But I would like to impress upon all young photographers the importance of studying art apart from photography, to be able to detect the untruthfulness of photography, for with untruthfulness there can be no true art.

Remember you are catering for a public which every day is getting more critical as art education spreads, and to keep your place you must head the procession, not follow behind.

## THE RUSSIAN PLATINUM MINES.

All the the platinum of Russia comes from one district, the government of Perm. In 1885 the output amounted to 110,635 ounces, and in 1886 to 184,336 ounces. Hitherto it has only been found in alluvial deposits, and is always associated with gold. The proportion of the two materials varies greatly, the platinum sometimes being in greater quantity than the gold, in other places not constituting above one per cent. The former deposits are the more profitable to work. The most important of these distinctly platiniferous deposits occur in the district of Nijni-Taguil, near the watershed of the Urals.

All the platinum-bearing streams of this locality descend from Mount Solovskaia, which is composed of a serpentine rock. The rivers have greatly exceeded their present size in former times, or else—which is more probable—have shifted their course; for the wide valleys in which they flow contain alluvial deposits of considerable extent, which are exploited for platinum, and to a less extent for gold. Between Mount Solovskaia and the diorite mass of Mount Blanche the surface is covered with rounded boulders of serpentine and peridotite rock. As these boulders decompose under the action of the air, they form a sand or gravel from which the metal can be profitably extracted. This is similar to what takes place in the weathering of the diamond-bearing peridotite rock of Kimberley, which is exposed to the disintegrating action of the atmosphere before being washed for diamonds. The platinum of the alluvial deposits occurs in grains, or pound of 10 Kgm. weight. The gravel often contains ½ ounce per ton of platinum, but can be profitably worked for $\frac{1}{7}$ ounce. The deposit near the banks of the river Martiane consists of a serpentine conglomerate, and is from 4 to 5 metres in thickness. Above is a thickness of 23 to 24 metres of barren ground, chiefly clay. Most of the alluvial auriferous deposits in which platinum is found are in the neighbourhood of peridotite rock, or of serpentine rock formed by the partial alteration of the peridotite. Thus, the River Mioss takes its source from a mountainous district mainly composed of serpentine rock, and accordingly the auriferous deposits near the head of the river are rich in platinum; but further down stream, as the serpentine formation is left behind, the gold becomes less platiniferous. Small nuggets of platinum are sometimes found embedded in pieces of serpentine, of peridote, and of chrome iron ore, all constituent minerals of the peridotite rock, which there is good reason, therefore, to regard as the true mother rock of the platinum. The richest deposit of the Nijni-Taguil district is that of Avrarinski, extending for a length of 2 Km., 20 to 60 metres wide, and of a thickness of 4 to 5 metres. Here the platinum is found to the amount of 4½, 5, and sometimes even 9 ounces per ton. The metal contains a small proportion of gold, about 0·26 Gm. per kilo, which is separated by amalgamation. The crude platinum left contains about 90 per cent. of pure platinum. From October, 1886, to August, 1887, the production at Avrarinski was 40,475 ounces. The working of these deposits is to a large extent sublet by the proprietors to the peasants of the district, who are paid by the weight of metal obtained. They construct their own washing and other machinery, which is made of wood, and is of a very crude description. The conditions with regard to cost of living, wages, and so forth are, of course, very different from those obtaining in new countries, such as South Africa, where the precious metals are exploited.

Sometimes the present beds of the rivers contain sufficient platinum to pay for working, in which case the course of the river is diverted, and the water power used for driving the machinery. A large part of the gold mining of the Urals is likewise carried on under the system of subletting, but where the mother rock—generally quartz or diorite—is worked, more expensive plant is required, and the work is carried on by the proprietors of the soil or by companies. — *American Druggist.*

## TRANSFERRING PRINTS TO GLASS.

The *Lithographer and Printer* gives the following method whereby any chromo print, or even clipping from newspapers, any engraving, no matter in how many colours, or on what kind of paper, may be transferred to glass by different treatment of the various kinds of paper.

Place the object to be transferred, face downwards, upon a larger sheet of Manilla paper; prepare a solution of from 1 to 3 per cent. of nitric acid in water, according to thickness and strength of paper, and how strong it was sized; ordinary newspapers, and printings and engravings on unsized glazed paper, require even less than 1 per cent. nitric acid. One of the purposes of adding nitric acid is to remove the sizing out of the paper. This solution apply with a sponge to the back of your object to be transferred. Be careful not to overdo it; you only want to render the paper soft, but not wet. Continue sponging with this solution until you see the printing plainly—that is, until the paper becomes quite transparent.

Laying down the paper, first adjust the upper right-hand corner to the mark on the plate, hold it there with the tip of your finger, and adjust the left-hand lower corner, but be careful to avoid air-bubbles. The practical printer and lithographer, of course, does not need this advice, but to the amateur it is very valuable.

To prepare the glass for trausferring, proceed as follows :— Clean the glass plate thoroughly with alcohol by means of a ball of clean cotton ; dry it well ; wash it with turpentine ; dry it off again ; place the glass or plate upon a smooth elastic layer (such as flannel), aud with this elastic layer upon a table, or, better yet, upon a rubber blanket in the lithographic hand press. Now coat the cleaned surface with a thiu coat of half turpentine and half dammar varnish ; let it dry from ten minutes to one day, according to temperature and thickness of dammar varnish. The coating should not be allowed to dry entirely ; it should be a trifle sticky. Lay the impression face downward upon the glass plate ; it is important that neither water nor acid touch the surface during the entire process. To properly lay down the impression, take it up with both hands by holdiug the left-hand under-coruer and the right-haud upper-corner. Be careful not to get any air-bubbles under the sheet. This is best accomplished by marking upon the plate the exact position and size of the sheet.

Press the sheet to the adhesive dammar coat ; this may be done iu many different manners. It does uot require a very strong pressure, but it should be observed that *each and every spot* has to be pressed repeatedly agaiust the plate. We advise the use of a small rubber ruler, or a blotter ruler, or any similar instrument. You may also use the hand, but, of course, not with much safety ; or a dabber of cotton or rags, or an ivory paper folder. When the paper sticks quite smoothly to the plate, fan it perfectly dry, and then, with *wet* finger tips, slowly rub off the paper, and the print, of whatever colour or nature it may be, will remain on the glass plate. Upon this apply another coat of dammar varnish containing veiy little turpentine (with too much turpentine you run the risk of washing the entire picture from the plate again). If all our rules are followed, a splendid picture will be obtaiued, which can be washed and cleansed with water the same as a window, as often as desired, aud the transfer will not be injured thereby. Such a picture will be visible from outside of the glass, day and night, the saue as auy glass painting.

## Patent Intelligence.

### Applications for Letters Patent.

14,278. L. M. Kords, 18, Buckingham Street, Strand, London, "Improvements in or relating to Shutters for Photographic Cameras."—*August 24th.*

14,336. Charles Walker Clarke, 32, Market Place, Devizes. "Improvements in Photographic Apparatus."—*August 25th.*

14,536. Benjamin Joseph Edwards, 45, Southampton Buildings, London, "Improvements relating to Photographic Cameras and to Apparatus for use in connection therewith." *August 28th.*

14,556. Leon Berteau and Henri Roussel, 55, Chancery Lane, London, "Improvements in Shutter Apparatus for Regulating the Admission of Light for Photographic Purposes."—*August 28th.*

14,648. Arthur Rayment and George Lyons, 34, Southampton Buildings, Chaucery Lane, Loudou, "Improvements in Photographic Cameras."—*August 29th.*

### Specifications Published.

4,956. *March 29th*, 1890.—"Rapid Printing Apparatus." W. F. Greene, 92, Piccadilly, and F. H. Varley, 82, Newington Green Road, both in London.

The film is fed from the sensitisiug tank or direct from a sensitised roll betweeu the rollers, and under a guide roller through the printing frame. In this is fitted au under negative and au upper movable negative, through which the film is simultaneously exposed on both sides. The upper negative is actuated by toggle-levers, which are worked from eccentrics on a shaft, being thus intermittently lifted to permit the film to be fed forward. The film next passes over rollers, between which works a roller on oscillating spring levers, by which the film is withdrawn from the printing frame and held taut. The film then passes through developing, toning, fixing, and washing tauks, provided with suitable feeding or squeegeeing rollers. These, with the correspouding rollers, are actuated through suitable gearing by an oscillating sector lever. The film is finally wound on a roll mounted on a frictional hub driven from the last of squeegeeing, &c., rollers. The exposure in the printing frame is effected by perforated shutters, which slide over apertures in the ends of the frame, being actuated by a crank disc.

5,046. *April 1st*, 1890.—"Cameras aud Change-Boxes and Lens Fittings." W. B. Luce, Boston, Massachusetts, U.S.A.

The camera has internal grooves at the sides to receive the plates, which are held in opaque holders. In the lower part of the camera slides the lens tube, which is of such length that a plate placed immediately behind the open inuer end will be exactly in focus. The plates are, before exposure, held in the upper part of the camera, beiug supported by the lens tube, which, to expose the plates, is moved outwards to allow the plates to drop in succession. The lens tube may be threaded, or it may slide in a stuffing box, or it may be surrounded on the outside by a light-tight bellows.

"Sheaths."— The holders are preferably of sheet metal having flanges at the top and bottom.

5,158. *April 2nd*, 1890.—"Change-Boxes and Dark Slides." C. H. Stanbury, 91, Fleet Street, London.

The change-box cousists of a case fitted with a number of slides between which the sensitive plates are placed. The slides are fitted with numbered tabs to indicate the number of plates exposed. To transfer the plates into the dark slide, the box and dark slide are put into position, and the lower slide of the box aud the upper one of the dark slide are withdrawn. The plates, when exposed, are returned in a similar way to the top of the box. The dark slide is provided with a slide or shutter for exposure. In a modification the plates are placed in sheaths with V ends, in which case only top and bottom slides are used, and they are provided with V ends to facilitate insertion between the sheaths.

5,193. *April 3rd*, 1890.—"Cameras and Change-Boxes." G. Dickinson, 144, Morley Avenue, Noel Park, London, N.

The plates are inserted through the back of the camera into grooves formed in the top aud bottom. From thence they are withdrawn into position for exposure by inclining the camera so as to drop them in succession into a groove in a turntable, which is then rotated so as to bring the plate into a transverse position. The handle by which the turntable is rotated works in connection with a uotch indicator, which serves also to secure the handle. A spring clip, actuated by a milled thumb-piece, serves to retain the plate iu the slot. The plate registers against inclined, velvet-covered strips, which serve to shut out the light from the remaining plates. Corresponding with the groove is a vertical plate, which may be provided with a focussing screen. The distance of the object being known, it is focussed by turning a poiuter to a certain number in the graduated arc.

5,215. *April 3rd*, 1890.—"Shutter." F. Beauchamp, The Poplars, Chadwell Heath, Essex.

The shutter consists of a slide, which is worked up and down by a crank-pin fixed on a crank disc in a slit between the lenses. The shutter is attached to the lens by means of a split ring, which is clamped on the lens tube by a screw. The crank, which is actuated by a coiled spring, is released by lifting a detent lever, which is lifted clear of the crank for rapid exposures, but only partly—so as to catch the crank and hold open the lens—for slow exposure. The time of exposure is regulated either by forciug a brake disc against the face of the crank disc by a regulating screw, or by connecting the crank to the axis of a rotary air-pump, the outlet of which is regulated by a valve. To give several exposures with one winding of the actuating spring, an escapement is used for releasing and stopping the crank at each revolution, aud the range of the spring may be increased by toothed gear.

Hackney Photographic Society.—Arrangements for September :—10th, "A Holiday in Isle of Man and Ireland," W. Fenton Jones ; 13th, Excursion ; 24th, Members' lantern night ; 26th, Excursion to Wanstead Park—meet at Leytonstone Station at 2.45 p.m.

## Proceedings of Societies.

Hackney Photographic Society.

A meeting was held on Thursday, 27th Aug., Mr. C. F. Hodge presiding. Work was shown by Messrs. Gosling, Barton, Roder, &c., and duly criticised.

A question as to silver papers led to statements by several members of their experience with various papers in the market.

The Secretary presented the Society with a guide-book to the North of Ireland.

Mr. J. O. Evans then gave his paper and demonstration on "Bromide Enlarging," devoting the greater part of the time to demonstration, as being more interesting. With the aid of a powerful oil light he proceeded to expose a negative of some cattle on Ilford rapid bromide paper, giving an exposure of twelve minutes. Blocking the landscape out, he, by double exposure, printed in some clouds. The resulting picture was exceedingly good. He did not use a clearing bath, but merely washed the print with cotton-wool.

---

Birmingham Photographic Society.

A meeting was held at the Midland Institute on the 27th August, Mr. W. Jerome Harrison, F.G.S., in the chair.

Favourable reports were read of the Leicester and Arley and Fillongley excursions. Letters were read from Mr. Geo. Bankart (judge of the Leicester excursion competition), and Mr. Harold Baker (judge of the Arley and Fillongley excursion competition), announcing their awards as follows: Leicester prize, Mr. William Rooke; Arley and Fillongley prize, Mr. A. J. Leeson.

The business of the evening was the exhibition of the negatives sent in for the developing competition. Forty-eight sets, of three plates each, had been exposed by a Birmingham professional, each set consisting of one plate each over and under-exposed, and the other about right exposure. Forty-four sets were applied for, the prize being awarded by the judge (Mr. Harold Baker) to Mr. J. T. Mousley for a very even set.

Mr. Thomason said that he should have preferred to have had the plates exposed on some landscape than, as they had evidently been, in a photographic studio.

Mr. Middleton thought it impossible to expose forty-eight plates out-of-doors in a constant light. He also mentioned the case of a lens not covering a plate so large as it was advertised to cover.

The Chairman mentioned the fact that the Kew Observatory now undertook to test lenses and grant certificates on payment of a small fee.

Mr. J. H. Pickard was the recipient, on the 21st of August, of a testimonial in the form of a lock-up stationery cabinet and secretaire, given by members of the council on his retirement from the secretarial duties.

The president, Mr. J. B. Stone—who has just returned from a visit to Japan—in making the presentation, remarked that it was not given with the idea of making any award, but as a bond of friendship.

Mr. Pickard thanked the council for their unexpected gift, and briefly traced the progress of the Club from its inauguration in 1885 to its present position.

---

London and Provincial Photographic Association.—The outing on Sept. 5th will be to Greenwich Hospital. Members and friends meet at the West Gate, Royal Naval College, at 2.30 p.m.

Photographic Club.—Subject for Sept. 9th, "Printing by Development"; Sept. 16th, "Intensifying and Reducing." Saturday outing to Greenwich; rendezvous at West Gate, R. N. College, at 2.30 p.m.

Formaldehyde.—It has recently been discovered that formaldehyde, or a combination of that with bisulphite salts, has a remarkable effect on negatives, inasmuch as its application, either as an ingredient of the coating solution, or by bathing the plate either before or after exposure, tends to the same result as would be had with a long exposure. It is said to work well, and to be free from all tendency to turn yellow.—*Anthony's Bulletin.*

## Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

J. B. and Co. — *Methylated Spirit.* In addition to the ten gallons of crude wood naphtha contained in every 100 gallons of methylated spirit, the Board of Inland Revenue now directs that there shall be further added twelve gills (three pints) of mineral naphtha of not less than ·80 specific gravity. Whilst contributing to the nauseous character of the mixture, it is believed that this small extra addition will not prejudice the use of the spirit in making varnishes; and, from experiments both with petroleum oil and common benzol, we feel disposed to agree in this opinion, the quantity prescribed being so very small—three parts in eight hundred.

G. J. S.—*Weather Forecasts.* The prediction for August 20th, "changeable, some showers," was hardly a correct forecast for the greatest deluge of the year, when the southern counties were flooded, and the rainfall in London amounted to 1·33 inches. The total rain for August (4·66 in.) was just double the Greenwich average.

A. Mackie.—*Iron Printing Process.* We noted your enquiry at the last technical meeting, but heard recently that Professor Meldola had not yet been furnished with the particulars of the process upon which you desired information. You will not, however, have long to wait in doubt, for the official report of the second Cantor lecture (at which this experiment was performed) will probably appear in to-day's *Journal of the Society of Arts.*

Executor.—*Scientific Books.* You might send on the list, and offer them to Mr. Wm. F. Clay, 2, Teviot Place, Edinburgh; or put them up to auction sale through Messrs. Sotheby, Wilkinson, and Hodge, Wellington Street, Strand.

Rev. W. F. C.—*Camera Details, &c.* 1. Your surmise is correct; we *are* contemporaries. 2. You hardly do justice to the Cardiff programme, which included many matters of photographic interest besides those alluded to in the President's address. Geological, geographical, archæological, and meteorological applications were uncommonly well represented. (See notice on page 609 of last week.) Mr. Mark Stirrup's Languedoc series were shown as a lantern display at the first soirée, and the local society got together a very creditable photographic exhibition, to which all members and associates were freely invited. 3. Without seeing drawings we can hardly advise you as to the camera improvements. Do you remember Mr. Stillman's clamping arrangement shown to the Photographic Society in January, 1872?

Cantab.—*Colour Troubles.* The use of isochromatic plates ought to help you in overcoming many of the difficulties referred to in your letter.

H. E. Ross. —*Pall Mall Exhibition.* The receiving day is Monday, Sept. 14th, for packing cases sent through Mr. Bourlet, 17, Nassau Street, Middlesex Hospital; or Wednesday, 16th inst., if delivered by hand at the Gallery. For further particulars, see the Assistant-Secretary's letter in the News of last week, page 614.

Quadragesimus.—*Alloys.* Probably equal parts of aluminium and tin would give a suitable alloy; but before making this, try zinc and tin in the same proportions, which would be much cheaper, easy to make, and sufficiently light for your purpose. It is a non-corrodible alloy, remarkably stiff, and easily workable.

Vero.—*Discoloured Emulsion.* It is possible that the india-rubber joint, by giving off sulphurous emanations, may have affected your silver emulsion. As a test, lay a piece of white filter paper moistened with silver nitrate in contact with the suspected rubber, and see whether it becomes blackened in consequence.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1723.—*September* 11, 1891.



CONTENTS.



## A NEW METHOD OF PHOTOGRAPHING FLOWERS.

THE average photographer, like most other ambitious persons, is constantly sighing after fresh worlds to conquer, and, after the fashion of human nature, is prone to forget or overlook the opportunities for study which are within reach of his hand. Some will be constantly complaining that they have not time or means to get to foreign climes, and that this country does not afford scope enough for their talents. On this plea many will settle down into the common rut of every-day bread-and-butter existence, and will never attempt to produce a picture which is not of the common second-class studio type. Others never seem to care to picture anything which is not brought to them, and which they are obliged to do simply because they do not like to throw an order away. Some of them will actually refuse work for their camera if it entail a little extra trouble, or a slight deviation from the beaten track. This neglect to encourage business is not so rampant as it was before the inroad of the amateur. That indefatigable gentleman—who can do anything, from making a transparency to enlarging a head to life size—has at least taught the profession that they must not rest upon their oars, but must pull hard unless they would be left quite behind in the race.

It is, then, to the interest of the modern photographer that he should do his best to strike out into fresh lines, and should look around him and think in what new direction he can work. If he have the opportunity of visiting one or two of the numerous exhibitions of photographs which are now so common, he will do well to study the various kinds of pictures there shown, and he will generally be able to learn what to avoid rather than what to follow. But in one sense he will do well to avoid that which is technically good. What we mean is that at all these exhibitions there is a plethora of simple landscape, portrait, and latterly a large number of "instantaneous studies," as they are called, added to which will be a goodly number of snap-shots due to hand-cameras. These subjects are getting tiresome by reason of their monotony. Can we not look around and find some description of subject which is not photographed quite so often? Our search will not be a very protracted one, for we soon see that flowers have been almost wholly neglected by photographers, while at the same time they offer a wide field for successful work.

It may at once be conceded that flowers, although coming under the head of still life, are not easy things to photograph. First we have the colour difficulty. This has been surmounted to a great extent by using colour-sensitive plates; and even when such plates are not procurable, the colour difficulty can be made to disappear almost entirely by use of a yellow screen and ordinary plates, taking care to stop down the lens and to give a very liberal exposure. Another difficulty, and a serious one, is the impossibility of getting the flowers into one plane, particularly when the subject photographed is actually growing. There are sure to be some vagrant stems which will insist upon thrusting themselves too near to or too far from the lens. Such wanderers from the right path can often be secured by black threads, which are quite invisible in the picture. Indeed, in photographing such flowers as orchids *in situ* in their glass house, it becomes absolutely necessary to be armed with black thread, hammer, and tacks, so that the long stems of the plants may be brought under some kind of subjection.

Cut flowers in vases make most beautiful pictures, as Mr. Stevens, who has won so many medals for such studies, has long ago proved to everybody. But in this case the flowers are, of course, under the control of the photographer, and he can get contrast of light and shade, as well as of position, without any hindrance. The same remark applies to bouquets, when the photographer is occasionally asked to take a picture of a bride's bouquet after he has photographed a wedding party. Such a bunch of flowers can be presented towards the lens, and the subject will be comparatively in the same plane.

If it is wished to arrange cut flowers otherwise than in a bouquet, or a vase, there is some difficulty in supporting them in a manner which is effective. An American writer some time ago suggested that they should be laid on a flat surface—upon a suitable background—and photographed from above. We consider that this method gives a somewhat unnatural result, for there is some difficulty in preventing the shadows cast by the leaves being unduly heavy. Some time ago we devised a plan of arranging flowers for photography by which excellent results may be achieved, but it involves some little trouble in the arrangement of the apparatus. It permits of the most delicate forms being supported without casting any shadows whatever, and the effects produced are extremely graceful and fairy-like. The necessary stand for the camera can be knocked together by anyone who can handle a hammer, and the expense is trifling.

The stand referred to was made of an old camera tripod, with the head removed, and a triangular piece of pine with a two-inch hole bored in its centre, substituted for it. Upon this board, the camera is placed face downwards, with its lens projecting through the hole. The legs of the tripod are conveniently shortened, so that the image of the flowers can be focussed without using a pair of steps. Midway between the floor and the camera, a sheet of window glass is supported by means of cords stretching from leg to leg, or the glass may be made to rest upon screws temporarily placed upon the legs. Upon this sheet of glass the flowers are arranged in whatever manner the taste of the operator may suggest. A plain background of any description may be placed a couple of feet below, simply resting on the floor. Its condition and general appearance is not a matter of much moment, for it will be out of focus. The lens which we used in the experiment was a portable symmetrical—stopped down—and, with the help of a yellow screen, and a very long exposure, we were able to get some very fine results.

It may be mentioned that this method of supporting objects during exposure is most useful for other objects besides flowers. When a number of small articles—such as coins, geological specimens, or shells—have to be photographed it is most convenient. They have simply to be laid in position, and there they remain, without any aid from cement, pins, or any of the supports which have to be called into requisition when such objects are photographed against a vertical background. We trust that those of our readers who will care to construct the very simple appliance here described will derive as much benefit from it as we have. As far as we know, the idea is original with us; but, in these days of universal photography, it is quite possible that we may have been forestalled.

Mr. Lowes Dickinson, who was associated with Charles Kingsley, F. D. Maurice, Rosetti, Mr. Ruskin, and Dr. Furnivall in the conduct of the Working Men's College in its early days, has an an extraordinary faculty for painting the portraits of deceased persons, even if he has never seen them, from photographs, the descriptions of friends, and from the study and observation of surviving relatives. His portrait of Gordon was a remarkable example.—*Star.*

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Mignon Paper—Intensifying Process for Prints—Enamelling Albumen Prints—Reactions of Developers—Printing with Flat Negatives.

*Mignon Paper.*—A new gelatino-chloride printing-out paper, known as "Miguon Paper," which is manufactured by a firm in South Germany, has found a great number of adherents within the comparatively short time of its existence. It gives prints very similar to platinotypes, of a very fine velvet-black tone, and the paper is, therefore, recommeuded by some practicians as a substitute for platinotype paper. It is, perhaps, a little more sensitive than albumen paper, but its treatment during printing is the same as with the latter. After printing, the paper is washed for about ten to fifteen minutes iu two or three changes of water, aud then toned in a specially prepared sulpho-cyanide of gold bath containing one gramme of gold chloride to each 100 c.c. of the liquid. This toning bath is furnished in two separate solutions (No. 1 and No. 2), of which equal parts are mixed, and diluted with distilled water. To toue twenty cabinets, 10 c.c. of Solution 1 are mixed with 10 c.c. of Solution 2, and the mixture diluted with 1,000 c.c. of water. The prints are toned until the half tones appear ash-grey, and the deepest shadows will no longer show a reddish colour by transmitted light. In this bath sulpho-cyanide of silver is formed by substitution, which adheres to the prints in the form of a slight veil; the latter is, however, quickly and completely removed in the subsequent fixiug bath, consisting of a ten per cent. solution of hypo. After about ten minutes the prints are removed, and thoroughly washed in clean water. Finally, they are placed in a bath consisting of 5 grammes of ammouia alum iu 100 c.c. of hot water, which bath should be cooled before use. After this hardening process the prints are again well washed, and then dried. In order to impart to them a fine matt surface, they should be squeezed on to a finely-ground glass plate. The whole process is very similar to the ordinary gelatino-chloride printing-out process, and, in my experience, quite the same beautiful platinotype-like effects may be obtained with Liesegang's aristo paper if treated in the same way.

*Intensifying Process for Prints.*—The new printing process which has been used by Max Lautner in his book, "Who is Rembrandt?" in order to increase the contrasts of the shades in the photographs of old oil paintings, has already been described in these pages on a previous occasion. As will be remembered, it consisted essentially in printing one and the same thin film negative twice on gelatino-chloride paper, firstly as usual, and then inversely from the back of the paper. Referring to this process, Dr. Stolze recommends another method, by which the contrasts or the intensity of the picture may not only be doubled, but increased about five times. It consists in the following: The negative is printed with short exposure on bromide paper, and developed with eikonogen as hard as possible, so that the lights remain quite clear. The print is then fixed and very thoroughly washed, and then bleached in a solutiou of bromide of copper. Finally, it is again washed very thoroughly and re-developed with eikonogen.

*Enamelling Albumen Prints.*—According to the *Photographische Archiv*, a highly glossy surface may be imparted to albumen prints without the use of gelatine in the following way. Equal parts of ox-gall and of alcohol are mixed, and the mixture is allowed to stand for several days with occasional violent shaking. A glass plate is coated with it evenly, and the albumen print, as it comes off the washing water, is placed on it, and allowed to remain on it for about one hour under pressure. As soon as it is dry, it will come off with a beautifully glossy surface.

*Reactions of some of the Photographic Developers.*—In the same journal, Dr. Schnauss publishes a series of experiments he has made in order to analyse the ready-prepared solutions of hydroquinone, eikonogen, pyrogallic acid, and hydroxylamine. The author states that the most characteristic reactions took place with iodine, bromine, and acetate of copper. If a few drops of the latter are added to a solution of eikonogen, its blue colour is converted into green; if added to hydroquinone solution, the cupric solution acquires a yellow colour, both remaining clear; whilst, if added to hydroxylamine, the cupric solution discolours. Very curious is the reaction in the case of a solution of pyrogallic acid, which at once produces a greyish-black precipitate by the addition of the cupric solution. With iodine, as well as with bromine, the hydroquinone and the eikonogen solution combines to a beautiful crystallising body. Iodo- and bromo-hydroquinone are constant and will keep, whilst the crystals of eikonogen melt in the air and are decomposed. If to a strong solution of hydroquinone a few drops of strong bromine water are added with shaking, the colour and the odour of the latter disappear, apparently black, metallic shining crystal needles being deposited. If the alcoholic solution of this combination is left to spontaneous evaporation in a flat dish, magnificent golden shining needles of more than one centimetre in length are produced, which appear brownish-red by transmitted light. The combination of iodine with hydroquinone shows quite an analogous behaviour; in water the two combinations are hardly soluble. If to a strong solution of eikonogen a small quantity of iodine tincture is added, a precipitate of white crystalline needles is soon produced, which are badly soluble, even in boiling water and in alcohol, and which soon decompose in the air, as mentioned above. The combination of eikonogen with bromine is more readily soluble in water, but it also decomposes soon. The author then describes the action of these combinations upon the exposed gelatino-bromide film. Bromo-hydroquinone and bromo-eikonogen darkened the film not at all, nor was a discolouring of the film to be observed in the case of pyrogallic acid, to which bromine was added. Hydroxylamine mixed with bromine darkened the film very slightly, with considerable deliverance of ammonia, which probably caused the discolouration. If a strong solution of pyrogallic acid was mixed with bromine water, the mixture acquired at first a dark yellow colour, and its odour disappeared, and finally its colour also disappeared almost entirely. For the above-described experiments pure hydroquinone was used; but the so-colled permanent hydroquinone manufactured by Dr. Byk showed the same behaviour. The eikonogen used was that manufactured by Dr. Andresen, in the powdery state.

*Printing with Flat Negatives.*—In order to obtain vigorous prints from thin and flat negatives, Wilh. Schleifer, a distinguished amateur photographer, proceeds as follows. During printing, a light green coloured glass plate is placed over the printing frame, in which, beneath the thin negative, a gelatine plate of low sensitiveness has been placed. The plate is exposed by candle-light for about five minutes at a distance of forty inches, and developed in an already-used solution of the following developer:—

| | |
|---|---|
| Hydroquinone ... ... ... ... | 1 gramme |
| Soda ... ... ... ... ... | 4 grammes |
| Sodium sulphite ... ... ... ... | 5 „ |
| Water ... ... ... ... ... | 200 c.c. |
| Salicylic acid ... ... ... ... | 0·5 gramme |

The first traces of the image should come out after from fifty to sixty seconds; if they come out sooner, the developer was too energetic, and it must be diluted. After the lapse of one minute, the plate is placed in a more concentrated developer—

| | |
|---|---|
| Hydroquinone ... ... ... ... | 1 gramme |
| Soda ... ... ... ... .. | 4 grammes |
| Sodium sulphite ... ... ... ... | 5 „ |
| Water ... ... ... ... ... | 100 c.c. |
| Salicylic acid ... ... ... ... | 0·5 gramme |

in which the plate will gain contrasts and density. The plate is developed until the image is faintly visible from the back of the plate, when it should be carefully washed, placed for five minutes in an alum bath 1 : 10, and fixed in a solution of hypo 1 : 8. After the diapositive has been washed thoroughly, a negative is taken from it in the same way, only with longer exposure, about from five to eight minutes being given this time, according to the density of the diapositive. From the negative thus obtained a print is taken on gelatino-chloride paper, using again a light green glass plate during printing. The print, which should be printed very deeply, is washed, toned, treated with alum solution, and fixed in a freshly-prepared fixing solution. If a suitable green glass plate cannot be obtained, it may be prepared by coating a clean glass plate with a warm gelatine solution 1 : 10, allowing it to set, hardening it with alum solution, and placing it in a solution of methyl-green 1 : 10. After drying, the colour should be removed from the non-prepared side of the plate with hot water.

## HAND-CAMERA WORK.

BY XANTHUS SMITH.

Just at this season, when so much use is being made of the small hand or so-called detective cameras, a few hints in regard to their use may not be out of place.

A good detective-camera worker should be like a good soldier or sportsman—always cool and deliberate. He should not throw away his ammunition. I am inclined to think that there are full as many failures of the mark in hand-camera shooting, taking it collectively, as there are in a battle where the majority engaged are raw recruits —that is, if the mark aimed at in working with the camera is the securing of fairly good pictures.

It should be the first business of the aspirant to success with a hand-camera to consider carefully what is really his aim in its use. Of course, in its first form, as a nearly entirely concealed instrument, and when used—as its name implies—solely for detective purposes, it makes little or no difference whether the results of the exposures are pictures or not, so that a good, clear likeness is obtained of the parties sought; but, as the amount of genuine detective work is small indeed compared with that of viewing generally, and as more than half the hand-cameras used do not conceal the object for which they are used, it should be a matter of importance that the user classify the work to be done under different heads, and be prepared with some knowledge of what constitutes an attractive photograph.

After objects in motion, which constitute the most important work of the hand-camera, comes the getting of picturesque or interesting subjects which are so situated that the setting up of a tripod and making a time exposure is inadmissible—such being buildings and character groups in towns and cities, and water views. Of course the former are much the most difficult subjects to manage, for, in addition to the necessary perfection of the instrument, there is the always troublesome matter of choosing a point which will give the best background, the best lighting, the right distance, and, above all, the instant when the best movement is to be had. All those views that come under the head of sporting views—such as the race-course and athletic ground furnish—should be relegated to those familiar with what is sought, as they will in every way be the best qualified to secure what will be the best understood and most acceptable to those interested in such matters.

To the large class—chiefly travellers—who are anxious to make the most agreeable pictures, we would chiefly address our remarks. Their aim should be to look out for the most characteristic living groups, buildings of historical interest or remarkable for their beauty or picturesqueness, and picturesque and agreeable water scenes and landscapes. Do not shoot away indiscriminately at anything and everything. It is an absolute waste of time and material.

In the landscape and architectural views, choose a good lighting, if you can, or let them alone, not only for your own credit, but for the credit of the scene. The light falling directly as you look will not give sufficient contrast and effect; and, as instantaneous views are likely always to be under-timed in the shadows at best, do not look towards the light, or you will have a black, patchy, heavy picture.

In taking groups, especially of figures and animals, always think of what is back of them. It is the most difficult thing under the sun to get good, quiet backgrounds, especially in street scenes; and we are generally so absorbed in what we are immediately aiming at that we seldom ever think of what is back of it until our picture reveals the whole to us as a confused jumble, often absurd in its queer light and dark spots. If we perceive that a fine group is going to be swallowed up in this way by patches of black shadow in doors and windows, and streaks of white in walls and facings and awnings and awning posts, we had better let it alone.

In landscape and river work for shipping, especially the latter, it will be found of advantage to work where there is a great deal of atmosphere (murkiness or fogginess), as we will secure better perspective in the former, and quieter backgrounds for our groups of vessels in the latter. When you find that objects along a shore a half mile off are going to be stuck fast to your boats, let the whole business alone. In the real scene, the eye easily separates the distance from what is in the foreground, but cannot in the little photograph, the eyes necessarily being focussed for all on the same plane.

For a great deal of hand-camera work there is no reason why as much care in selection of subjects, and in securing proper effects of light and shadow, should not be given as in taking views with a camera set upon a tripod; and if such care were bestowed there would be far less waste of films and plates, and a much greater proportion of amateur photographers whose work would be a genuine gratification when shown to their friends, and a source of happiness to themselves.—*American Journal of Photography.*

## THE ALBUMEN PROCESS.

BY P. C. DUCHOCHOIS.

| | |
|---|---|
| Honey ... | 2 grams |
| Ammonium iodide ... | 0·8 gram |
| Ammonium bromide ... | 0·6 ,, |
| Iodine ... | 0·1 ,, |
| Albumen (whites of eggs) ... | 100 c.c. |
| Water (distilled) ... | 10 ,, |

Grind together the honey, iodide, bromide, and iodine with the water, add the albumen, and beat the whole to a solid froth. Let settle for ten or twelve hours, then decant the clear liquid for use.

Honey is added not to increase the sensitiveness of the photo-film, on which it has little action, but to prevent the crystallisation of the haloid salts resulting from the desiccation of the albumen, which retains no water, becomes hard and without elasticity, and then cracks, forming a multitude of small fissures. Even, for this reason, we often added two drops of glycerine to the above quantity of albumen.

The glass plates should be cleaned with extra care and well dusted before coating. It may seem strange that such a direction should be given to the readers of the *Bulletin*, for clean plates and no dust is a *sine quâ non* in all the photographic processes, but in this one it has still a greater importance on account of the thinness of the film and the purposes for which the process is now occasionally employed. In fact, to effectually exclude dust, the operating room should be swept, dusted, then sprinkled at least one hour before albumenising and gelatinising.

To coat the plates, procure a pneumatic holder, or, in lieu, a round wooden stem about 20 cm. long by 5 or 6 cm. in diameter, cut at one end in the form of a cup 2 cm. deep with a rim about 1 cm. broad. On the rim gutta-percha is melted and spread, which, for use, is softened over an alcohol lamp in order to fix the plate upon it.

The plate, being firmly fixed on one of these holders, is wetted under the tap, drained, and when still damp, it is coated twice over, in opposite directions, with the albumen solution. This done, drain well off the excess of albumen by one corner, tilt the plate to bring the albumen to the opposite corner, and back without a stop to the middle of the plate, then gently roll the stem between the hands to equalise the liquid on the whole surface, and the liquid accumulated at the edges being wiped off, let the plate dry spontaneously in a box made *ad hoc*, into which it is placed on levelled shelves. The plate can also be dried on an iron level stand by heating it with an alcohol lamp, care being taken not to coagulate the albumen. Some authors advise for the same purpose an iron plate heated to not over 50° to 55° C., upon which a number of plates can be dried at a time. At 65° C. albumen commences to coagulate.

We compound the silver bath thus :—

| | |
|---|---|
| Silver nitrate ... | 8 grams |
| Zinc nitrate ... | 3 ,, |
| Glacial acetic acid ... | 2 c.c. |
| Water ... | 100 ,, |

To sensitise, pour in a porcelain tray longer than the albumenised plate a certain quantity of silver solution, raise it to bring all the liquid at one end, place the plate on the upper end, then, in one move, lower the dish so that the whole plate be flooded at once. In this manner, stains from scums and transparent lines from stops when the plate is sensitised by dipping, are avoided. From twenty to thirty seconds are sufficient to coagulate the albumen, and transform the iodide and bromide of ammonium into silver compounds.

On their removal from the silver solution, the plates are washed moderately, in order not to entirely eliminate the silver nitrate in excess from the photo-film; a wash in water twice renewed, then rinsing rapidly, is sufficient. In that state the sensitive film keeps for about a week. If wanted to keep for a longer period, the washing should be done more thoroughly, and a preservative flowed over the albumen just after washing and draining. The preservative known as gum-gallic used in the collodion dry process answers well. We compound it as follows:—

| | |
|---|---|
| Gallic acid ... ... ... ... ... | 5 parts |
| Ammonium bromide... ... ... ... | 0·1 part |
| Gum arabic (best) ... ... ... ... | 5 parts |
| White sugar ... ... ... ... ... | 2 „ |
| Water ... ... ... ... ... ... | 480 „ |

Dissolve and filter before use.

The albumen photo-film is little sensitive to light, and therefore one should expose for a long time to obtain a developable image. The cause of this, which, in the old time, we thought due to the influence of the vehicle, is now easily explained by that which produces the various degrees of sensitiveness of silver bromide, that is, the different states of agglomeration into grains of the molecules of the silver haloid, which, of course, can occur only in a liquid and in certain circumstances, such, for example, as the cooking in the preparation of gelatine emulsions.

In a collodion film, the granulation is hardly apparent, but exists nevertheless; while in an albumen film, the transformation of the alkaline haloid into a silver salt taking place in a solid substance, the molecules of the new compound remain in a state of extreme division, and little sensitive to the luminous influence, as shown by Stas. No granulation is visible in an albumen photo-film examined by the microscope. This explains the incomparable sharpness of the images photographed by the process, and, as above said, the necessity of very long exposures.*

The development is effected by a physical or a chemical (alkaline) developer. The latter permits, as usual, to reduce by half at least the time of exposure, but, owing to the thinness of the silver film, and specially to the silver iodide, on which the alkaline reagent has but little action, the image remains weak, and one must, consequently, continue the development with the physical developer to obtain intensity.

The chemical developer consists of—

| | |
|---|---|
| A.—Sodium sulphite cryst. ... ... ... | 20 parts |
| Pyrogallol ... ... ... ... ... | 5 „ |
| Potassium bromide ... ... ... | 0·5 part |
| Water ... ... ... ... ... | 480 parts |
| B.—Sodium carbonate... ... ... ... | 20 parts |
| Water ... ... ... ... ... | 480 „ |
| or— | |
| Ammonium sesquicarbonate ... ... | 10 parts |
| Water ... ... ... ... ... | 480 „ |

For use, equal volumes, adding B gradually.

When the image is visible in all its parts, the film is rinsed under the tap, then flowed with the following solution:—

| | |
|---|---|
| Pyrogallol ... ... ... ... ... | 1½ part |
| Citric acid ... ... ... ... ... | 1 „ |
| Water ... ... ... ... ... ... | 480 parts |

which first neutralises the alkalinity of the film, and when a few drops of a 5 per 100 solution of silver nitrate are added, progressively develops the image to the proper general intensity.

* Compared to gelatine plate, sens. 20, the time of exposure is about as 120 to 1.

The diapositives are printed by contact, and developed as ordinarily, the negatives by a physical developer, compounded with gallic acid, pyrogallol, or a mixture of these two reagents. Gallic acid gives a greenish reduction, excellent for negatives, and not very objectionable for diapositives used for projections. Pyrogallol gives ordinarily a red reduction, or occasionally a red purple reduction. The developing solution should be acidified by citric or tartaric acid. A mixture of gallic acid and pyrogallol gives generally a brown reduction. These different allotropic forms of metallic silver are very curious. The red reduction is toned with difficulty by gold, platinum, or palladium chlorides.

Gallic Acid Developer.

| | |
|---|---|
| Calcium acetate* ... ... ... ... | 3 parts |
| Water ... ... ... ... ... ... | 480 „ |
| Gallic acid ... ... ... | To saturation (C. Laborde) |

This developer is employed at the temperature of 60° C.

Pyrogallol Developer.

| | |
|---|---|
| Pyrogallol ... ... ... ... ... | 3 parts |
| Citric acid ... ... ... ... ... | 1 part |
| Water ... ... ... ... ... ... | 480 parts |

Employed at the temperature of 35° to 40° C.

Mixed Developer.

| | |
|---|---|
| Gallic acid ... ... ... ... ... | 3 parts |
| Pyrogallol ... ... ... ... ... | 1 part |
| Acetic acid No. 8 ... ... ... .. | 30 parts |
| Water ... ... ... ... ... ... | 480 „ |

Employed at the temperature of 50° C.

Heating the developer has for its object the accelerating of development in order to force the details out. It is not necessary when developing diapositives.

To develop, the plate is flowed with the selected developer, which is allowed to act for a minute or so, then a little of a solution of silver nitrate (5.100) is added, when the development proceeds regularly. The silver nitrate should be added by degrees, and not much of it must be employed, for then the blacks would intensify too rapidly, and a harsh picture obtained.

The proofs are fixed in a solution of sodium thiosulphate (hyposulphite) at 8 or 10 per 100 of water. The toning presents some difficulties. The process by which were toned the admirable diapositives of Ferrier, Soulé, and recently those of Mr. Lévy, is a secret which has been well kept since nearly forty years. Some operators tone by sulphuration, either by fixing in an acid bath, or treating the proofs with a very diluted solution of ammonium sulphide. These processes, which succeed well with collodion diapositives, generally tinge yellow those on albumen films.

In our practice we operated in the following manner:—The diapositive, developed and well washed, is treated by a weak solution of mercuric chloride until uniformly blackened, stopping the chemical action when the reduction commences to bleach. The plate is then washed and fixed in the following solution, where the colour generally assumes a bluish black:—

| | |
|---|---|
| A.—Sodium thiosulphate ... ... | 8 parts |
| Water ... ... ... ... | 360 „ |
| B.—Auric chloride ... ... ... | 0·5 part |
| Water ... ... ... ... | 120 parts |

Mix, little by little, B to A, *not the reverse.*

We have now at our disposal many processes to tone before and after fixing. They are too well known by the readers of the *Bulletin* to be mentioned in this paper.

* Calcium acetate acts as an accelerator. It can be discarded when developing diapositives.

## PHOTOGRAPHIC CHEMISTRY.*

BY PROFESSOR R. MELDOLA, F.R.S.

The general considerations which have been offered apply to the special subject of photography with full force. A person may become an adept as an operator without knowing anything of physics or chemistry; there are thousands of photographers all over the country, who can manipulate a camera and develop and print pictures with admirable dexterity, who are in this position. If we adopt the narrow definition of technical instruction, we should appoint such experts in our colleges, and through them impart the art of taking pictures to thousands of others. But would our position as a photographing nation be improved by this process? I venture to think not. We might be carrying out the ideas of certain technical educators by adopting this method, but I do not imagine that in the long run the subject itself would be much advanced; our position in the scale of industry would not be materially raised by the wholesale manufacture of skilful operators. And so with all other branches of applied chemistry; it is technologists whose knowledge is based on a broad foundation that are wanted for the improvement of our industries. These are the men which are raised in the technical high schools of the Continent, and whose training the continental industries have had the wisdom to avail themselves of.

To become a photographic technologist, as distinguished from a photographer, it is desirable, therefore, that the student should have received instruction in the general elementary principles of physics and inorganic and organic chemistry. When thus prepared, he may begin to specialise his studies, and the real technical training will be commenced. The application of chemistry to photography will naturally divide itself into two branches; the chemistry of the materials used in the art, and the theory of the chemical changes occurring in photographic processes. With respect to the chemistry of photographic materials, time will not admit of any attempt to draw up a complete code of instruction. Nor is this necessary on the present occasion, for the requirements will be met by the simple statement that this branch of the subject should be an extension of the ordinary chemical training, with special reference to the preparation, properties, and reactions of the compounds which the student is most likely to have to deal with in photography.

Since the compounds of silver are by far the most important of photographic chemicals, it will be advisable to commence with these. After the study of the ordinary qualitative reactions of this metal, the student should be well practised in the quantitative estimation, both gravimetrically and volumetrically, so that the value of commercial silver nitrate may be ascertained with precision. The reducing action of fused sodium carbonate, of zinc and acid, and of alkaline solutions of glucoses on the silver haloids, can be made the basis of practical exercises in the recovery of silver from residues. It is desirable also to point out, and to illustrate by experiment, that silver is displaced from the solution of its salts by the more electro-positive elements—hydrogen, copper, mercury, iron, zinc, lead, and so forth. It is important also to demonstrate that silver is more electro-positive than gold and platinum, and displaces these metals from solutions of their salts.

In illustrating such points in the chemical history of silver as those referred to, and, in fact, in all practical work leading from ordinary chemistry to photographic chemistry, it will be found advantageous to adopt the general principle of performing the experiments, whenever practicable, both in glass vessels and on films. This method is admirably adapted to lead the student from the general science to its special application to his subject. For example, having shown that the salts of silver are reduced by such reducing agents as alkaline pyrogallol, ferrous sulphate, &c., in test tubes, and having allowed the experimenter to convince himself that the precipitate in these cases is really metallic silver, the production of a film of the metal may be shown by taking a sheet of paper coated with silver nitrate, and, when dry, painting stripes of ferrous sulphate solution on the coated surface. On washing out the excess of nitrate from the unreduced portions, it will then be realised that the dark stripes consist of finely-divided silver on a paper surface. With these silver films many instructive demonstrations can be given. Thus, the fact that silver displaces gold and platinum from solutions of the salts of these metals may be shown by passing the paper through a bath of platinic or auric chloride, when the silver stripe undergoes a change of colour, indicating the replacement of that metal by gold or platinum. A comparison of the strip thus treated with a portion of the original strip—by treating both with nitric acid—clearly proves that the platinised stripe has lost its solubility in that acid. The application of this principle to toning and intensification will naturally follow when photographic processes are being dealt with.

While demonstrating the reducibility of silver salts by such reagents as ferrous salts, &c., it must be strongly urged that reduction of the silver salt is accompanied by a corresponding oxidation of the reducing agent. This fact will be made apparent by the chemical equations; but it is important that the student should verify it experimentally. Many ways of doing this will suggest themselves, but it will be sufficient if I give one appropriate example. Every student may be assumed to be familiar with the different behaviour of ferrous and ferric salts towards potassium ferrocyanide. Now, on adding a solution of ferrous sulphate to a solution of silver nitrate we get a precipitate of silver, indicating the reduction of a silver salt. That a simultaneous oxidation of the ferrous salt takes place is proved by filtering off the silver and adding ferrocyanide to the solution, when Prussian blue is at once formed.

The precipitation of finely-divided silver may be made use of to illustrate some of the more obscure phenomena with which the photographic chemist is frequently confronted. It may be well at this stage to broach the idea that photographic chemistry, like all other branches of applied chemistry, does not begin and end with a series of reactions which can be written down in the form of equations. This mode of treating the subject may be academic, but it is not technical. It is believed by many experimenters that silver is capable of existing in several different conditions of physical aggregation according to the manner in which it is precipitated from its solutions. Thus the deposit obtained by adding ferrous sulphate to a solution of silver nitrate is grey; the product obtained by reducing silver solutions with organic ferrous salts is darker in colour.* It is possible that the difference of colour in these cases may be due, as suggested, to the differences of molecular aggregation. The rate of reduction may have something to do with it, and the well-known coloured forms of precipitated gold, studied by Faraday, may be referred to in this connection.

But, on the other hand, there is another possibility which must be borne in mind, and well emphasised in dealing with photographic chemistry. I allude to the tendency which silver and its compounds possess, in common with many other metals, of bringing down and retaining traces of foreign substances, in whose presence the metal or its compounds may be precipitated. This kind of combination is not sufficiently recognised by orthodox chemistry, because it does not take place in definite proportions, but there are many branches of applied chemistry where this so-called molecular combination plays a very important part. The practical outcome of these considerations is that the student of photographic chemistry cannot be too early prepared for the occurrence of indefinite combination, and he must not be allowed to suppose that, because a distinct formula cannot be ascribed to such compounds, that they are outside the pale of chemical science. I have thought it necessary to utter this caution, because in the present state of knowledge we must not commit ourselves to dogmatic assertions about allotropic modifications of silver. It may be that the different colours of reduced silver are due to the retention of "traces" of some foreign substance.

The haloid salts of silver will, of course, demand a considerable share of attention from the photographic chemist. The preparation and properties of these compounds should be

* Abstract of Cantor Lectures, continued from page 629.

* Pyrogallol will reduce silver nitrate in neutral or slightly acid solutions. It is not necessary to add alkali to show this reduction; the solution may be distinctly acid with acetic acid.

studied in detail; their solubility in well-known reagents, such as ammonia, potassium cyanide, and sodium thiosulphate, should be made the subject of practical exercises, and the chemical changes undergone can be made readily intelligible to the student whose elementary training has reached the necessary stage of efficiency. It will add to the thoroughness of the instruction if the student is made to realise that the statement that the silver haloid is soluble or insoluble in such or such a reagent is by itself inadequate; he must understand that solubility means the formation of a new compound which is more soluble than the original haloid. Thus, the absorption of ammonia by silver chloride can readily be shown by putting some of the dry haloid into a tube, weighing, and then passing dry ammonia gas till there is no further increase in weight. Then, again, silver chloride may be dissolved in strong ammonia, and the solution allowed to stand till the crystals of the ammonio-silver chloride separate. The preparation of the soluble silver sodium thiosulphate, by the method of Lenz,* is a good practical exercise, and the study of the salt will help to make clear why the silver haloids are dissolved by the thiosulphate. It is necessary to point out that by the same reagent three† distinct products may be obtained:—

1. Silver thiosulphate, $Ag_2S_2O_3$, by adding a solution of sodium thiosulphate to a solution of a silver salt, keeping the latter in excess. This is a white insoluble salt, which soon darkens by the formation of the sulphide:—$Ag_2S_2O_3 + H_2O = Ag_2S + H_2SO_4$.

2. The insoluble double salt $Ag_2Na_2(S_2O_3)_2$, formed by adding silver nitrate solution to a solution of sodium thiosulphate till a permanent precipitate is formed. The product is dark-coloured, and probably contains sulphide; it gradually becomes darker on standing, owing to decomposition with the production of sulphide.

3. The soluble double salt $Ag_2Na_4(S_2O_3)_3$, formed by the action of excess of sodium thiosulphate upon the last salt, or by adding a silver salt to a strong solution of the thiosulphate, keeping the latter in excess. In the solid condition this is a white crystalline salt, readily soluble in water, and much less prone to decompose into sulphide than the preceding salt.

Among other properties of the silver haloids to which attention may be directed are their decompositions by various haloid acids and salts. This information cannot but be of the greatest use in practical photography. I have summarised the facts in the form of a table.‡

The haloid salts of the alkaline metals and of ammonia, especially when in concentrated solutions, dissolve more or less of the silver haloid, with or without decomposition. The silver haloid is thrown out again either in an unaltered state, or transformed into another haloid by decomposition on diluting the solution with water. The solubility of the silver haloids in solutions of other salts is a feature in their chemical history which the photographic chemist will find it useful to be put in possession of. Thus, these haloids are to some extent soluble, and especially the iodide, in strong solutions of silver nitrate. It must be pointed out that in all cases where a silver haloid is dissolved by another salt, a double salt is probably formed.

The study of the forms of reduced silver will have prepared the way far taking into consideration the state of molecular aggregation of a substance as influencing its characters. The silver haloids should be dealt with from this point of view, both on account of the importance of bringing into prominence the factor of physical condition, and because of the possible practical bearing of the subject in connection with the preparation of sensitive emulsions. According to the mode of preparation of the haloid, such important characters as solubility, reducibility, optical absorption and colour, and photographic sensitiveness, are capable of being influenced. Thus, the state of concentration of a solution of silver nitrate, from which the chloride is precipitated by hydrochloric acid, appears to influence the solubility of the chloride in the acid. It is possible that this is due to the different forms of the chloride under these conditions. By dropping a solution of silver nitrate into strong hydrochloric acid, a considerable quantity of the chloride is dissolved. The chloride, prepared in the ordinary way, by precipitation from silver nitrate and a soluble chloride, after being washed and dried, is certainly not soluble in hydrochloric acid to the same extent. Here, again, it is possible that precipitation in the presence of strong hydrochloric acid gives no time for the molecular condensation of $(AgCl)$ to $(AgCl)_{nx}$, and that the former of these aggregates is more soluble than the latter.

I have called attention to this feature in the chemical history of the silver haloids because, in the present condition of practical photography, no student should be allowed to neglect this all-important subject. How far Stas's classification of the forms of silver bromide and chloride will stand the test of further investigation is at present doubtful. Some experimenters recognise only two modifications, and others three; while Stas himself recognises four, viz.:—

1. Flocculent, white or yellow. Produced by the addition of a solution of a soluble bromide or hydrobromic acid to a solution of silver nitrate in the cold. Both solutions must be dilute (0·5 to 1 per cent.); if the silver is in excess, the bromide is white; if the soluble bromide is in excess, the precipitate is yellow.

2. Pulverulent; obtained from the preceding modification by brisk agitation with water. This form is produced more rapidly in neutral than in alkaline solutions. It is described as a yellowish-white powder, which, when dry, becomes intensely yellow on heating.

3. Granular; produced by adding a very dilute boiling solution of ammonium bromide to a boiling solution of silver nitrate containing $\frac{1}{10}$ per cent. of this salt. Obtained also by the action of boiling water on the preceding modifications, the first (flocculent) giving a dull yellowish white, and the second (pulverulent) giving a bright, yellowish-white powder. By prolonged boiling with water, the granular modification gradually becomes sub-divided, and, after several days' boiling, forms a kind of milky emulsion, from which the bromide settles out very slowly. The precipitate which then subsides is pearly white, becoming intensely yellow on agitation with a strong solution of ammonium bromide.

4. Crystalline, or fused; obtained by fusing any of the other forms. This modification is never employed in photographic operations.

Among other points in the chemical history of the silver haloids which are of photographic importance, the relative reducibility claims special notice. In the earlier part of his practical work, the student will have obtained metallic silver from the haloids by reduction, but he must now be made to realise that this reduction is more readily effected in the case of the chloride than the bromide, and more readily in the case of the latter than with the iodide. And first of all, in order that the true chemical significance of reduction may be made intelligible, let a simple demonstration be given showing that, by the action of reducing agents, such as ammonium pyrogallate, potassio-ferrous oxalate, &c., the halogen is actually withdrawn from the silver, and is to be found in the solution by the usual tests. Then, in order to show that the chloride is more reducible than the bromide or iodide, a solution of potassio-ferrous oxalate may be diluted till it becomes just too feeble to reduce the bromide. Some of the same solution will be found to reduce the chloride readily. Adopting the usual course, and passing from test-tubes to films, sheets of paper coated with the three silver haloids may be streaked with the same solution of ferrous oxalate or ammonium pyrogallate, when the order of reducibility will be shown by the fact that the chloride gives a darker stripe than the bromide, and the latter a darker stripe than the iodide.

*(To be continued.)*

* A solution of silver nitrate is added, drop by drop, to a strong solution of sodium thiosulphate till a permanent precipitate (the insoluble double salt) just begins to appear. The solution is filtered, and alcohol added till the white crystalline (soluble) double salt separates out.

† There are probably many more double thiosulphates of silver and sodium, and even this series of salts requires further investigation. Thus, Mr. C. H. Bothamley informs me that by mixing 4 $AgNO_3$ with 5 $Na_2S_2O_3$ and adding alcohol, he obtained a white precipitate in which the ratio Ag : S was 1 : 1·961. The ratio calculated for $AgNaS_2O_3$ is 1 : 1·683. This salt is *soluble* and stable. By the action of 3 $Na_2S_2O_3$ on Ag Br and fractional crystallisation, he has isolated two crops of crystals corresponding with the formula $Ag_2S_2O_3, 3\,Na_2S_2O_3 = Ag_2Na_6(S_2O_3)_4$.

‡ See Photographic News, p. 213.

## Notes.

When writers who are not photographers give advice upon matters photographic, it is astonishing into what absurdities they are apt to lead their unfortunate readers. In a New York paper we find the suggestion that photographers who have a difficulty in determining how a view will look when photographed should carry with them a number of ferrotype plates, so as to use one in such a case and thus save weight of glass for trial plates. We fancy that for the average photographer the working of one process is quite sufficient, without the encumbrance involved in the necessary impedimenta for two. The writer in question has evidently never heard of films or roll-holders, else he would know that the ferrotype is not the lightest thing which a photographer can carry.

---

It is a curious but useful feature of photographic literature that the old processes are now and again trotted out and their virtues extolled, presumably for the benefit of those who came in with gelatine. We have lately noted several enquiries and notes with regard to the old collodio-albumen process, not, of course, for negative work, but for the production of lantern slides. We are not sorry to see this, for the old process is one of the best that can be adopted for that particular purpose. Any amount of density can be obtained, the lights are as clear as the clearest glass, and the image in so hard and permanent that no varnishing is necessary, and hardly anything can injure it. Its one disadvantage is that the slides must be made by contact, for it is far too slow for camera work. There are one or two professional workers—and we believe only one or two—who still hold to this method of producing slides, and they always are busy.

---

A contemporary gives a long list of methods by which a glass stopper which has become fixed in the neck of a bottle may be loosened, but strangely enough the best way of all—at least, so we have found it in our own practice—is omitted. The plan we refer to is to wet a cloth in very hot water, hastily wring it, and to wind it quickly round the neck of the bottle. After allowing the heat sufficient time to expand the glass, the stopper is quickly wrenched round, and will generally come away with ease. Every laboratory should possess a block of hard wood in which are slots of varying size to fit stoppers of different gauge, such block to be used as a wrench. But all trouble with stoppers is obviated by taking care that each is lightly touched with a little vaseline when its bottle is first brought into use.

---

According to the *Photographic Times*, a certain ingenious worker at Chicago keeps in his studio a supply of beautifully proportioned dummy feet for the use of those ladies whose pedal attachments are not by nature of the Chinese pattern. He anticipates a brisk business by this innovation, but we sincerely trust that he will be disappointed, for we have no wish to see photographic falsehood encouraged.

---

At the late Buffalo Convention there was exhibited in the apparatus section a tubular revolving show-case, which, we are told, consists of a narrow, tall glass frame, divided into panels for holding photographs, the entire arrangement being cylindrical and driven by clockwork. The object of the contrivance is to show the entire contents of the frame at one revolution. A quick printing machine for emulsion paper was also shown. By the motion of a crank the paper is unreeled from a spool, exposed, and cut off ready for development. It will be remembered that this is no new idea, for Messrs. Marion were showing a machine of the same kind about six years ago.

---

The art critic of a Sunday paper, in contending that artists who produce big pictures have a difficulty in selling them because they are beyond the capacity of the middle-class home, uses a curious argument. He says: "To this neglect of the conditions of the home of all but the wealthy few, is greatly to be attributed the preference for line engravings and for photographs, which artists agree to deplore." Is this really the reason why engravings and photographs are purchased, and do artists "agree to deplore" the "preference" in this direction? We fancy any print publisher will say that persons buy copies, rather than original pictures, simply because the latter are utterly beyond their means. The "conditions of the home" have nothing to do with the matter. It is the condition of the purse which determines whether a man can buy an original or a copy. As for the agreement of artists to "deplore" the preference for engravings or photographs, we doubt whether an artist is to be found who will agree with this supposed argument, seeing that the sale of the copyright for purposes of reproduction is a material gain to his pocket, and adds to the value of his picture by making it popular. The only persons who "deplore" the "preference" of photographs are—or used to be—for some occult reasons of their own, the publishers of engravings.

---

But photography has, in these days, run engraving so closely that publishers have found themselves compelled to adapt the former to the manners and customers of the latter. A notice attached to photographic copies of pictures, to the effect that only a certain number will be printed, and the negative will then be destroyed, is now occasionally to be seen in the shops of the print-sellers and picture-dealers.

---

The scientific traveller is now expected to be a skilled photographer. Nothing in the present day is taken on trust. In the course of Mr. Fawcett's description of prehistoric remains in South India given at the Congress of Orientalists, he mentioned that near Bellary he found "pictures" incised upon the rock. These pictures, says the *Standard*, seem likely to prove of inestimable value, but, adds our contemporary, "no photographs were shown apparently, and the Congress has decided to appoint a small committee, which shall make a thorough investigation." That photographs were anticipated is very clear.

---

The artificial asphalt described by *Industrie* seems worthy of investigation at the hands of scientific photographers. It is formed by heating resin with sulphur to about 250° C., when sulphuretted hydrogen is given off, leading to the formation of a black, pitchy substance, resembling Syrian asphalt in appearance and properties. It is insoluble in alcohol, but dissolves readily in chloroform, benzine, and other liquids. More important than all, it is sensitive to light.

## THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT GLASGOW.

[By our Special Commissioner.]

The splendid collection of photographic pictures now to be seen in the suite of rooms known as the Institute of the Fine Arts, in Glasgow, only proves still further a fact that, after all, needs no proof—viz., that the Scot is thorough in all he undertakes; and it is only fair, therefore, to say at the outset that it is the finest assemblage of really good photographic productions that it has ever been my good fortune to see. How much hard work it has entailed only those who have laboured in a similar direction can justly estimate; and when it is known that Messrs. Annan and Miller pulled down the pictures from the principal wall of the large gallery, and made an entirely different arrangement in order to get a more striking *coup d'œil*, one need not be surprised that a great success has been the reward of their zeal. As an old photographer accustomed to look with pride at the annual show in Pall Mall, I could not help longing for just such a splendid home for the pictures brought together year after year by the Photographic Society of Great Britain. All the galleries (and there are six of them) are lit in the most perfect manner; and, in consequence, many pictures that I have seen before in Pall Mall in the corners of the room on a dull November day gain so much by the stronger light that they almost seem new productions. Of course, many of the photographic works are old friends, but there is an unusual amount of entirely new work, and for this result great praise is due to the energy that must have been displayed by the Glasgow Society's committee of management. The exhibition was open to the members of the press on Tuesday about mid-day, and later on I saw a fine subject for a picture. While the guests were partaking of the liberal luncheon spread at one end of the gallery, the judges were evidently desperately struggling to complete their labours, for they were seen frantically rushing from room to room to verify the awards, or to settle some debatable point; but evidently a moment came when they could work no longer, for they were now to be seen eagerly clutching chairs that they might sit down and rest during the luncheon so well earned. When they had settled down to serious work with knife and fork, the famished workers were surrounded by a little crowd, who looked on with almost wolfish eagerness. This seemed most unaccountable, for full opportunity had been given them to satisfy their hunger. I soon found out, however, that it was not cooked meats that they craved, but "copy." It was a race between the evening and morning papers to get first publication of awards. One hour more and it would be too late for the evening publications. An inspection of the long list published last week will show that it could not be replicated in a minute—hence the assemblage of the materials for this epic picture, which, unfortunately, *was not produced* by the graphic art of photography. In the evening the principal gallery was well filled with a brilliant audience, notwithstanding the torrents of rain that had fallen all day. The fair dames of Glasgow also do nothing in a half-hearted manner, if I may judge by the full evening costume adopted by most of them, and the consequent life and brilliance given to the opening ceremony.

The Lord Provost, in a commendably short speech, commenced the proceedings, and the president, Mr. J. Morison, called upon Mr. Valentine Blanchard for a few remarks on the Exhibition from the judges' point of view. Mr. C. W. Hastings and Mr. J. D. Welford also briefly spoke in its praise, and, after a vote of thanks to the Lord Provost, the gay throng moved about the rooms to inspect the pictures, whilst a capital orchestra went through a well-selected programme of music. When the principal room had sufficiently thinned, an impromptu ball terminated the proceedings.

An examination of the list of awards will show a large number of well-known names, but, whilst very naturally many pictures already distinguished by medals at other exhibitions are to be found on these walls, I am extremely pleased to see a large quantity of new work of the highest quality.

Of course, it is needless to speak of pictures already described in these pages. I shall therefore, as far as possible, pick out work new to me for notice. I am pleased to be able to say that pictures that stand out in consequence of vile taste in mounting or framing are very few and far between, and therefore the general effect is very good indeed. Great taste has been displayed in draping the room with material of harmonious colour, to give effect to the pictures, and all unavoidable spaces have been filled with drapery of the same colour. There is, in consequence, a unity and completeness rarely seen out of London.

Mr. Warneuke, of Glasgow, has produced some striking portraits of large size. "Ethel," a sweet, sunny-faced child, combines boldness of light and shade with delicacy in the details. "Desdemona," by the same gentleman, is the portrait of Mr. Herman Vezin's accomplished pupil. It is an oblong picture, and the figure is extended on a couch with hand on chin. The expression is well done, and the light drapery very delicately treated. There is also a very powerful portrait of Mr. Herman Vezin as Othello. The facial expression, as might be expected, is very fine, and the whole picture shows great skill on the part of the artist, with a slight exception: the lens employed was too short in focus, and the folded arms are, in consequence, out of drawing and unduly magnified; they show capacity, however, to strangle, and so far there is fitness.

Chancellor and Sons exhibit a very beautiful profile head called "Juliet." The lighting is unusually fine.

Tunny and Co. distinguish themselves by a series of portraits, also of large size. The most striking is of a lady most graceful in pose, but spoiled by a mass of dark, which runs through the picture in such a manner as to rob the figure of its necessary support. This is a great pity, for it is an unusually beautiful picture, and so little was needed to make it all right.

Mr. Van der Weyde has gained a gold medal for a group which is certainly one of the most perfect ever produced by the aid of the camera. Four beautiful girls in white are, apparently, watching from a balcony some interesting scene. Simple and unaffected is the pose of all four, and there is, apparently, the grace of unconsciousness; and yet, when it is known that the sitters are the beautiful Dorothy Dene and her sisters, it only shows what may be accomplished by an artist, assisted by accomplished sitters. The varied textures of the white dresses are rendered with consummate skill.

Mr. Harold Baker is again to the front with well-dressed models. Dorothy Dene, in classical dress, is one of the best. All the pictures show great skill in the management of pose and arrangement of drapery on the figure.

Mr. Swan Watson shows some female heads powerful in treatment, and one or two are very Rembrandtesque. Perhaps the contrast of light and shade is a little too marked to suit all tastes.

A very original effect has been produced by Messrs. Annan and Sons in an enlargement from a hand-camera picture. By means of a very blue tone, the cold of dawn on the mountain side is admirably expressed. The "Dusty Miller" is a powerful bit of light and shade, but the window spoils all; when the window panes are darker than the sash bars, one is inclined to think there is something wrong somewhere. The bromide enlargements are unusually good, and one of a lugger, with the shadows luminous by aid of the very transparent water—an effect so successfully painted by Mr. W. Bartlett—is wonderful when it is remembered that the effect is produced by monochrome only. Mr. Snell Anderson is to be complimented on this achievement, and also for a landscape where the ripple caused by a boat carries the shadows, broken up into long lines of light and shade, right down to the front of the picture.

Mr. H. P. Robinson has sent four of his best landscapes with figures, and no one will be surprised that he has taken a silver medal for them. They have been already described in these pages, however.

The Countess Loredana da Porto exhibits, in addition to the flash-light pictures which were so much admired at Liverpool, some peasant groups which add still further to her reputation as an artist. Perhaps the best is in the *genre* class. Two peasant girls are near a rude wayside cross, and one is kneeling at its foot, whilst the other is clinging to its stem. The back of the kneeling figure is shown, and the face is in profile. The subject is a hackneyed one, but it has been carried out with simplicity, and the peasant costumes are so natural that there is a great air of reality about the whole picture. A little more tone in the sky would have made it much better.

Mr. David R. Clark's four landscapes are a little unequal in quality; one of them is of such high artistic excellence that a gold medal has been awarded to it. The materials of the picture are extremely simple. Some trees in the foreground, one of which, a slender, graceful one, has fallen out of the upright, and sends its branches obliquely into the picture, whilst an expectant maiden leans against its base, furnish the principal features. The picture is full of light and atmosphere, and the chiaroscuro unusually fine. The title of the picture is the "Trysting Tree," and it is more like one of Leader's landscapes than a photograph.

Mr. Horsley Hinton's "Where Swaying Reeds Eternal Music Make" is a picture treated in the same manner as the one sent to Cardiff, and described in these pages a few weeks ago. No sharpness anywhere, and the rough paper gives a tone value which is certainly very artistic when the beholder is far enough away to get the mystery of effect imparted by distance. When close to the picture, it presents the appearance of a powerful sketch executed by bold washes of sepia, and, when sufficiently far away to lose the texture of the paper, it might be mistaken for an etching. The title sufficiently explains the subject. I certainly like it better than the one sent to Cardiff.

Mr. James Patrick's "Lowland Shieling," whatever that may be, for I had not time to ask, is a very charming little landscape. Only a little hollow on the hill-side, with sheep placidly browsing here and there, and a cottage in the distance—that is all the material employed; but the result is a picture the author may well be proud of.

Mr. J. G. Pratt shows some pictures so red in colour that their otherwise artistic quality might easily be overlooked, for the atmospheric effects are very beautiful in all. The one of Greenock from the old quay is perhaps the best of all. Landscapes in Bartolozzi red will not do.

Mr. C. Reid's cattle subjects are good, and his poultry better, but the best of all is a beautiful collie dog. The texture of the dog's coat is quite a study for animal painters. "Rats!" and also "Rats Again!" are most successful pictures. Expectant dogs are climbing up a stable door, and eagerly look for its rapid opening. The shadows thrown by the figures of the dogs are most transparent. There is a blaze of sunshine, but no hardness anywhere. Mr. J. Catto has taken a silver medal for this achievement..

Karl Greger still keeps to his red colour, but his groups are highly artistic; "Wood Gatherers" and "Gipsy Encampment" are perhaps the best.

Mr. W. J. Byrne's interiors are very fine, and I would much like to see them printed in platinum, for the glazed surface makes them look so very brilliant and out of harmony with the pictures near them. Mr. Court Cole's interiors are now so well known that they do not demand any special mention. Total absence of black shadows, and not a trace of halation anywhere, are their most striking points.

Mr. John Stuart has produced the very best flash-light pictures I have yet seen. Large interiors are perfectly illuminated into the remotest corners, and children are occupied in the most unconscious manner; in fact, there is not the slightest evidence of the powerful light employed. I asked Mr. Stuart if he had any new arrangement of light for the purpose, and he answered that he just used as much light as he wanted, that was all.

Mr. J. W. Wade's hand-camera pictures are very varied, and the chiaroscuro of several of them very fine. Mr. Archibald Watson's marine studies are full of light and yet not at all weak; and one or two of Mr. W. D. Welford's little pictures unusually good. There is one with the sunshine breaking out from behind a dark cloud that is one of the most perfect marine studies I have ever seen. The entries in this class, however, are not nearly so numerous as might have been expected.

Mr. Ralph H. Elder's "Snap-shots on Italian Lakes" are capital little pictures quite spoiled by the bad taste displayed in their framing. Indeed, it is almost impossible to look at them in consequence of the vividness of their surroundings.

The *genre* class is most disappointing. Apart from several well-known subjects—Robinson's "Primrose Time" being among the number—there is very little new work that calls for special notice. "A Duet," by Mr. Alex. M. Morrison, is certainly an exception. In the foreground a rustic lad is piping away on a whistle, and immediately opposite a bird on a twig is apparently trying to split his pipe in emulation. The pose of the boy is original, and the whole picture well carried out, but the selection of focus has given such sharpness to the foreground that the distance looks painfully blurred. Just a little more diffusion of focus would have made the little scene perfect.

Mr. F. Bremner has been unusually successful with several difficult Eastern subjects. The best is one called "Nature—Blasting Rocks." Detail is carried into the deepest recesses of the rocks, and yet there is perfect detail in the white dresses of the Eastern workers. Surely this is a difficult achievement!

Mr. J. E. Austin has not been quite so happy as usual in the picture he calls "She Won't Go to School." The grouping is very natural, but either it is under-printed or the negative over-exposed. At any rate, it is not so striking as usual with this gentleman's work.

The pictures in the Champion Class are, of course, well-known. Mr. W. Crooke has taken the gold medal for his remarkable series of distinguished Scotch Law Lords, shown at the Crystal Palace in the spring. They are natural in pose, and most effective in lighting. Strong individuality is shown in each, and any of them might easily be mistaken for a mezzotint by Sir Joshua Reynolds. Praise cannot easily go further. To Mr. Lyd. Sawyer has been given the second gold medal for his series of now well-known subjects, one of the Tyne series being selected for the honour.

A special silver medal has been given to Mr. Ralph Robinson for his fine series of "Artists at Home." These have, however, been well described in this journal, and do not need further mention.

Mrs. B. G. Benetto's pretty little portrait studies have taken the silver medal in the lady amateur class, and Mrs. Janie Hignet the bronze for some well-lit landscapes.

Prince Ruffo is most masterly in his treatment of rugged, time-worn faces, and Mr. W. J. Jenkins has made distinct advance in his "Young Heads." To the first has been awarded a silver medal, and to the latter a bronze.

I have endeavoured, within the limits available for this article, to notice a few of the most striking of the pictures new to the readers of this journal. When it is remembered that, besides the new work, a very large proportion of the most distinguished pictures executed during the past few years is to be found in this Exhibition, some idea may be formed of its completeness and importance. Several of the leading photographers have fitted up special exhibits for trade purposes, and, of course, not entered for competition. These will attract great attention, for most of them have been fitted up with great taste. There is, besides, a very good show of apparatus. There are a few novelties. One of the simplest and best is a camera clip exhibited by George Mason and Co. By means of three slotted brass pieces hooked at one end, so as to grip the stretching bar of the tripod legs, and held in position by a screw that travels at will along the three slots, the camera stand can be made rigid in a moment, and the anxious photographer will no longer dread the slipping of his stand on marble pavements. Surely this is a good thing. A capital lamp is shown by J. Lizars. Direct light is not used, but only the light reflected from the back of the lamp, which is painted yellow of the most non-actinic kind. Mr. W. Middlemiss is the maker of two useful instruments. One is for slide making, and is so simple that a girl with scarcely any knowledge could work it; and the other, the invention of Professor Barr, of the Glasgow University, is designed to make the lecturer's demonstration much easier. By an arrangement of mirrors, the lecturer can point on the slide itself, instead of doing so on the screen. It is difficult without a diagram to describe either of these inventions, but they struck me as specially useful. Doubtless there are many other things worthy of notice, but space will not permit it.

Mr. Paul Lange was the first lecturer, and his now well-known lecture on Iceland was attentively listened to by a crowded audience; and Mr. T. N. Armstrong followed on Thursday with "A Tour in the Trossachs with a Caravan," and, of course, illustrated on the screen with pictures taken during the journey. It is intended to have a popular lantern entertainment every night during the Exhibition.

All praise should be given to the Glasgow Society for its enterprise. They deserve success, for they have earned it.

## PHOTOGRAPHY AS AN AID TO ILLUSTRATIVE AND PICTORIAL ART.

BY W. H. JOBBINS, SUPERINTENDENT OF THE SCHOOL OF ART, CALCUTTA.

We will first consider photography as applied to the practical purpose of illustration. Many are probably ignorant of the ordinary mode of procedure in the production of every-day illustration—technically called event work. Suppose, for example, some event of public interest is to take place, and the special artist of an illustrated periodical is called upon to produce an illustration, which possibly may have to appear the following morning. The event is over in a few minutes, yet in that short time the illustrator may have to collect sufficient material which will enable him to produce the required illustration. He proceeds usually by scaling his figures, determining their relative sizes and positions, and makes notes of the background and details of costume. When the background is elaborate, this takes time, and then the practical character of photography as an aid asserts itself. One shot with a hand-camera, and the illustrator goes away comparatively happy, having thus secured his essential details. Without the aid of photography, the every-day production of illustrations—as in the *Daily Graphic*, for example—would be impossible. The illustrations may be drawn during the day, photographed by electric light at night, reproduced on metal, printed, and in circulation by six o'clock the next morning. The results of photography are apparent in the numerous processes employed in every illustrated periodical. In the old days, when the drawings were made directly upon the wood, the artist was entirely at the mercy of the engraver; and the agony and heart-burning of the illustrator, when he too frequently saw his work ploughed up, may be imagined. The drawings were mostly in *facsimile*, line for line upon the wood, to facilitate matters for the engraver; the block was well or badly cut, and the original drawing irretrievably lost. Photography has changed this, and the artist may choose his own method. In wood-engraving, the drawing is now made upon paper or other material, and in most instances photographed upon the block, and the original is thus saved. One interested in such matters can readily see how much is due to a process which has been the means of preserving so many original works, by inspecting the black and white drawings at the office of any first-class illustrated paper, as the *Graphic* or *Illustrated London News*, and the regret one feels that original work by such men as Millais, Rosetti, Holman Hunt, Sandys, F. Walker, Tenniel, Pinwell, Houghton Fildes, E. J. Gregory, and many others now famous, has been irretrievably lost. Imagine what an incentive to good work, and ultimate joy, it must be to the artist to feel assured that his work, reproduced by one of the many processes now in vogue, will be as near a *facsimile* to the original as it is possible to make it, so that it is pretty clearly demonstrated what the art of illustration owes to photography.

The phases of art iu which photography can be of material help covers the whole range—classical, historical, *genre*, laudscape, animal, marine, or architectural. In classical painting the artist in search of material may go to Pompeii, for example, make his studies and notes, and then supplement those by photographs. Imagine the advantage he has over one who has visited the place, say, fifty years ago. The photographs give him the minutest detail, texture, and every quality, except colour; and if a practical knowledge of photography has been acquired, he may select the special objects, or particular points of view, best suited to his purpose. He can thus collect details of costume, accessories, and backgrounds with the greatest facility, knowing, at the same time, that they cannot be otherwise thau absolutely true. In *genre*, the painter can arrange his figures, and get a pretty good idea of their composition and value. In landscape, he can study an infinite vatiety of effect and detail. The same in marine, and what can be more beautiful than some of the photographs of water with the varied movements and reflections? I know that old-fashioned painters of the couservative school will condemn this as rank heresy. There is a sort of impression that the aid of photography in art implies—at least, in painting—something which is incompatible with its dignity, and that the man who uses it, and is fouud out, loses caste among his *confrères*. But the fact remains that photography is extensively used, though paiuters will not admit it. The very fact of being accused of having had recourse to photography is libellous, and Van Beers brought an action in Paris some years since, and won his case, because a journalist asserted that photography has been used in his picture of "The Siren." The journalist was misled by the photographic look of the picture; it was as near the realisation of photography in colour as anything could be, and technically it was extraordinary work.

This is eminently a realistic age, especially in art matters, and the public have discovered a great deal as to appearances and facts in nature from photography. In every expedition now-a-days a camera is looked upon more or less as a necessity. It is remarkable the resemblance between the work of some eminent painters, when reproduced by photography, and photographs direct from nature. This is, perhaps, most noticeable in the work of the modern French school, of that portion who work out-of-doors. The subject is not generally so much thought of as the absolute truth of the rendering; but the "values" or proper relation of parts must be true. One can readily see this by glancing through any of the numbers of the *Figaro Salon*, and noticing the work by such men as Daguan-Bouveret, Dupré, Pasini, Ridgway-Knight, Muenier, Haquette, Tattegrain, &c.

In the use of photography as an aid to illustrative and pictorial art, it is pre-supposed the artist should, if possible, be his own photographer, so that the result should be that of his own labours, and I cannot see what possible objectiou there can be to a camera supplementing a sketch book. By the aid of both, he certainly will be able to obtain results which he could not if one or the other were alone used.

One does not wish to exalt photography at the expense of art, and in the great essentials photography has no place; but it may become, in judicious hands, a most valuable aid. One has been accustomed to cant phrases generally applied to painting, also applied to photography, especially that of "Impressionism"—subduing detail for effect—in which Mr. Emerson made himself so conspicuous. I do not wish to reopen the question, but some of the finest photographs I know in portraiture were of this character. I remember years since seeing portraits by Mrs. Cameron—notably of Darwin and Tennyson—which, to my mind, as portrait photography, were unsurpassed. They gave the character, and not merely the surface quality; you saw the individual behind the frame, and not thrust in front of it; the lines on the face were there, but not obtrusively so; and the faces had not been retouched until the surface was that of porcelain. It is vain for the photographer to try to infuse into his work the undefinable charm of great artists like Millet or Corot. Millet only gave the esseutials, religiously keeping out what was unnecessary; his hard-worked and uncomplaining peasants were the embodiment of the silent toil of centuries. Photography at its best can only give you facts; they may be subdued by being out of focus, but still they are there. Nor can photography give you the poetry of an evening as Corot did, where you saw the gentle ripple ou the water, the breeze shaking the leaves on the trees, and the feeling of peace and repose.

The majority rush into photography without even a rudimentary art knowledge, the result being that our æsthetic sense has many a rude shock; as it so frequently happens that, while the technique is all that could be desired, the choice of subject and composition are execrable. By a rudimentary art knowledge it is not implied that a knowledge of drawing eveu is essential, but some idea of selection, composition, and beauty of line. This can, iu a measure, be attained by carefully considering wherein consists the beauty of one picture, when compared to another of equal merit, technically remembering the maxim that "art is to conceal art."

It is a curious fact that in painting, as in photography, the results are in a way the reflex of the idiosyncracies of the individual. A common photographer makes his sitters look common; one only has to take the average work of the cheap photographer and see how vulgar his sitters appear, and the way in which any objectionable peculiarity seems to be intensified.

Even Mr. Pennell, in his recent tirade against photography, generally admits the aid it is to the illustrator. If I mistake not, practical proof of this is to be found iu some of his illustrations; only two examples ueed be mentioned. In the article on "Venetian Boats" in *Harper's Magazine* for March, 1890, pp. 541 and 553, the two illustrations look as if drawn from photographs well known in Venice, that used to be sold at a shop in the Piazza, on the left-hand side, between San Marco and the Caffé Floriau. The illustratiou on p. 541, called "An Afternoon Call," is practically a *facsimile* of the original; the other, called "Passenger Boats from the Islands," only partially so. The principal boat with figures appears to be drawn from a photograph taken some twelve years since at the Murano side of the city ou the Foudamenta Nuova, where these boats laud; they are never seen near the Custom House, where Mr. Pennell has drawn them.

The London and Provincial Photographic Association.—September 17th, The Lantern Microscope Demonstration, by Mr. T. E. Freshwater.

The Photographic Club.—Subject for September 16th, "Reducing and Intensifying"; September 23rd, "Enlarging." Saturday outing to Ockley; train leaves London Bridge 12.50.

## ON SOME CONDITIONS AFFECTING REVERSAL OF THE PHOTOGRAPHIC IMAGE.

BY HENRY SUTTON.

In drawing to a conclusion the discussion on Professor Minchin's paper at the last Conference of the Camera Club, Captain Abney remarked that the blue rays have a reducing and the red rays an oxidising effect. Of course Captain Abney taught us these facts many years ago, but I mention their expression at the Conference because it immediately occurred to me—though why I cannot say, for Professor Minchin's entirely different subject was distinctly before my mind—that reversal of the photographic image must be a result of an over-balance of the two effects, by the exposure being continued for such a time as to allow the reducing action of the blue rays to act all over the plate ; in short, to produce fog, even in the protected parts, it would allow the red and yellow-red rays time to re-oxidise such parts as are more or less unprotected.

It occurred to me that, by exposing a plate to ordinary light, so that the blue rays may exert their power of reduction, and then subsequently exposing such reduced (or fogged) plate, in contact with a negative or positive, to red rays, by interposition of a red screen, the result on development should be reversal.

On putting the matter to the test, I found such apparently to be the case. Captain Abney, Colonel Waterhouse, and Fox Talbot have noted the advantage of a preliminary exposure in assisting the reversal of image, but I have not noticed attention drawn to the connection between the preliminary and subsequent exposures, or the manner in which such a reversal is possibly produced by the relative action of the reducing and oxidising rays. So that in this paper no claim is set up how to produce reversal, nor yet to the effect that the red and yellow are the active rays in so doing (for, in the language of the patent office, "I am aware all this has been done before"), but what I desire to call attention to is how they probably act, and that in producing reversal a proper relation should exist between the reducing and oxidising rays. By a consideration of the subject from these points, an every-day method of producing reversed negatives suitable for collotype and carbon work may result. From the influence fog seems to have in producing the results, I am afraid it will be impossible to produce reversed negatives suited to ordinary relief block processes, in which clear glass is of more importance than density. In the following experiments very powerful exposures are used, and the results, except where otherwise stated, developed with Wood's hydrokinone developer used in strength as directed on the label, and therefore normally developed. It is interesting to note that development required about the same time as a normally exposed plate, and hence contrasts very markedly with the results obtained by Mr. Humphery when using hydrokinone, as stated in his paper read at the Club last October. In my experiments, judging a plate by its colour, I note such as appear to contain iodide produce the best results; this, I believe, is in agreement with the experiments of Captain Abney and others.

The theory of reduction and re-oxidisation suggested by the following experiments, it will be noticed, explains the alternate reversal, such as negative, positive, negative, positive, sometimes mentioned in the journals. These alternate reversals have not come under my notice experimentally.

*Experiment* 1.—Expose an Edwards' landscape plate to white light for one minute, then, still in light, placed in printing frame in contact with a negative, but separating them by a tissue of red stained gelatine. This was exposed to direct sunlight (July) for five minutes. On examination in the dark room by ruby light, it showed a delicately printed-out positive. It was then developed with Wood's hydrokinone developer, to which a small portion of same firm's eikonogen solution was added.

*Result.*—The plate developed in the ordinary manner, except that the positive print-out image disappeared shortly after immersion in the developer, and in less than one minute the reversed negative had begun to appear, rapidly gained density, and for ordinary work little inferior to the original.

*Experiment* 2.—Edwards' transparency plate, preliminary exposure to white light, then in contact with positive exposed for twenty minutes to diffused sunlight through red gelatine tissue.

*Result.*—Fog all over ; no reversal.

*Experiment* 3.—Same conditions and result as Experiment 2.

*Experiment* 4.—Preliminary exposed Edwards' landscape plate to direct sunlight half minute ; then exposed to direct sun through red tissue for five minutes.

*Result.*—Good reversal.

*Note.*—Unless otherwise stated, Edwards' landscape plates are used.

*Experiment* 5.—As Experiment 4, but exposed ten minutes through red tissue.

*Result.*—Reversal, but rather thin.

*Experiment* 6.—No preliminary exposure ; then exposed through red tissue five minutes' direct sun.

*Result.*—Developed thin negative, which gradually reversed to thin positive on front surface, and remained thin negative on back surface of film. On fixing, the result is barely visible. This experiment should be compared with Experiment 4, being under similar conditions, except that Experiment 4 had half a minute preliminary sunning, and produced a good reversal.

*Experiment* 7.—In order to have some idea of the developing value of the preliminary exposure, each side of a plate was exposed to candle-light at 6 in. for ten seconds; total exposure, twenty seconds; then exposed with red tissue to sun (haze) for four minutes.

*Result.*—Very good reversal, and would indicate that the preliminary exposure should be such as to produce, if developed, a good density. In this experiment an extra minute of exposure to sun would have produced clearer glass.

*Experiment* 8.—Preliminary exposed plate to candle-light, as in Experiment 7; then exposed ten minutes to diffused sunlight without red tissue.

*Result.*—Reversal, but not so good as 1, 4, 5, 7.

*Experiment* 9.—Preliminary exposed Edwards' transparency plate, as in Experiment 8; then exposed, without red tissue, to ten minutes' diffused sunlight.

*Result.*—Exceedingly weak reversal.

*Note.*—Where transparency plates are used, they are given an increased exposure, on account of the lower sensitiveness. They are not suited for reversal, but the landscape plates are particularly well adapted for it.

*Experiment* 10.—Preliminary exposed landscape plate to candle-light; then covered half with red tissue, and exposed to 12 in. of magnesium at 12 in. distance.

*Result.*—No reversal under tissue, but reversal where uncovered. Evidently the exposure under red was insufficient. At the same time, this experiment indicates that a good relative proportion of the two classes of rays may exist in the magnesium light, such as would produce sufficient fog all over the plate through all parts of the superposed image, and at the same time be sufficiently active in oxidising rays to undo the work of the reducing rays where the plate is least protected.

*Experiment* 11.—Preliminary exposed plate, as in Experiment 10, and exposed, without red tissue, to 8 in. of magnesium.

*Result.*—Thin reversal.

*Experiment* 12.—Same conditions and result as in Experiment 11.

*Experiment* 13.—Preliminary exposed plate for thirty seconds to candle at 6 in.; then covered half the plate with blue tissue, and exposed to 12 in. of magnesium at 6 in.

*Result.*—Partial reversal under the blue, but full reversal under the uncovered part. In this experiment the print-out image appeared as strong under the blue as under the uncovered part, yet, on development, a full reversal only occurred where uncovered. It is well to note here that a similar print-out image under red tissue reverses perfectly. It will be noticed in this experiment the advantage gained by increasing the power of the light, compared with Experiments 11 and 12.

*Experiment* 14.—As Experiment 13, except that a green tissue was used to part cover the plate and the magnesium burnt at 8 in. This experiment shows the result of reversal on the front surface and non-reversal on back surface of film very distinctly; the effect only took place on the uncovered portion of plate, the tissue covered part being insufficiently exposed. Experiment 13 shows, had the magnesium been burnt 2 in. nearer, a full reversal would have occurred. It is interesting that this plate has caught the transition stage nicely, as the result would disappear on fixing. The plate was not placed in hypo.

*Experiment* 15.—No preliminary exposure and no coloured tissue. Exposed to 12 in. of magnesium at 4 in.

*Result.*—Very good reversal.

*Experiment* 16.—As Experiment 15, but preliminary exposed for thirty seconds to candle-light at 6 in.

*Result.*—Reversal as in Experiment 15.

*Experiment* 17.—No preliminary exposure, then exposed to 18 in. magnesium but at 4 in.

*Result.*—Very good reversal.

*Note.*—Experiments 15, 16, and 17 show the improvement in results by stronger exposure.

*Experiment* 18.—Edwards' slow isochromatic plate. No preliminary exposure; no coloured tissue. Exposed to 12 in. of magnesium at 4 in.

*Result.*—Good reversal.

*Experiment* 19.—Edwards' transparency plate. No preliminary exposure. Exposed to 12 in. of magnesium at 4 in.

*Result.*—Very weak reversal.

*Note.*—Edwards' landscape plates, exposed to from 12 to 18 in. of magnesium weighing 4 gr. to the foot, and burnt at 4 in. distance, produces the best results, no preliminary exposure being required, sufficient fog being produced to develop to full density where the plate is protected, and at the same time the oxidising rays do their work on the unprotected parts.

*Experiment* 20.—Strips of red, blue, and green tissue were cut and laid on a negative so as to divide it into four sections, one of which was uncovered. No preliminary exposure being made, a landscape plate was exposed in contact with the sectional negative for five minutes to direct sunlight.

*Result.*—Under the blue and uncovered sections a very strong print-out positive appeared, and under the red and green a delicate print-out positive. The blue and uncovered sections developed decidedly positive, which gradually fogged away and left very thin reversals, mere ghosts. The red and green sections developed strong and vigorous reversals in a very decided manner, without any strengthening of the print-out positive. The development was the same as met in every-day procedure, but under the blue and uncovered sections there was an increase of strength in the print-out image, then a gradual fog, and finally a thin reversal. The green section is slightly more dense in deposit than the red.

*Experiment* 21.—Preliminary exposed plate one minute to candle-light at 6 in., then proceeded as in Experiment 20.

*Result.*—As in Experiment 20, but rather more deposit under the blue and uncovered sections, and more general fog. These experiments, I think, tend to show that a reduction is to some extent requisite in order that a subsequent oxidisation may occur, but that a total reduction is not desirable, and that this reduction may be obtained either by a preliminary exposure, or by the concurrent action of the reducing and oxidising rays in one exposure; in the latter case, the oxidising rays require so much time for their work that the reducing rays have ample time to exert their influence on even the most protected portions of the plate; evidently the best conditions being those under which a full-timed exposure or fog is made to balance a full effect of the oxidising rays, so that when the latter produce as nearly as possible clear glass, the former may develop to full density.—*Journal of the Camera Club.*

## ROYAL CORNWALL POLYTECHNIC EXHIBITION: PHOTOGRAPHIC DEPARTMENT.

Completion of Awards.

Messrs. Taylor, Taylor, and Hobson, of Leicester, send a pair of nine-inch lantern objectives, which the judges put to a practical test, and Mr. Brooks used them at his lantern entertainment; their performance left nothing to be desired, and the judges have awarded them a first silver medal. Mr. R. R. Beard exhibits a pair of his gas governors, with special packing to prevent straining and bursting of the pressure gauge, which seems to be very efficient; to these have been awarded a first bronze medal. He also sends a carrier for dissolving effects with a single lantern, which is a very clever arrangement, and is highly commended. The same exhibitor shows a compact little optical lantern, which packs into a very small compass, and will recommend itself to those who admire portability.

Mr. C. A. Rudowsky writes that as the price of platinum is lower, the manufacturers of the Pizzighelli paper, Dr. Adolf Hesekiel and Co., Berlin, have reduced their prices 25 per cent.

Carl Suck.—The *Photographisches Wochenblatt* of the 3rd inst. appears with two black-bordered pages in memory of Carl Suck, who died on September 2nd, after protracted illness, at the age of fifty-eight. The deceased, though engaged in business-management, devoted much time to original research, to the advantage of photograghy. The *Zusammenkunft Praktischer Photographen Berlins* pays its tribute in the record that they have lost a beloved colleague, a true friend, and a zealous promoter of the art.

## Patent Intelligence.

### Applications for Letters Patent.

14,689. Arthur Richard Wormald, Sutton, Surrey, "A Photographic Lantern Slide and Transparency Printing Frame."—*August 31st.*

14,695. Henry Edward Colville, 24, Chapel Street, Belgrave Square, London, "Improved Photographic Dark Slide for use with Celluloid Films."—*August 31st.*

15,032. Edmond Lambert Coninck, 53, Chancery Lane, London, "Improvements in Photographic Shutters."—*September 5th.*

### Specifications Published.

5,227. *April 3rd*, 1890.—"Camera with Roller Slide and Shutter." C. Whitney, Chicago, Illinois, U.S.A.

The camera belongs to the instantaneous or detective type, and is made in the form of an opera glass, book, or other like article. When in use, the front of the camera is drawn out and held by spring catches. A sensitive ribbon mounted on a roller slide is preferably used, or the sensitive paper may be cut in sheets and fed into position by rollers. In the roller slide the roll of sensitised paper is placed in a tube, through a slit in one side of which the end of the ribbon is drawn, passed round the back of the exposure chamber, and connected by a fastener to strap attached to the receiving roller. In some forms of the roller slide there is a knife actuated by a roller, which cuts the ribbon into lengths as it enters a receiving chamber. In another form the film is stored in sheets, and transferred to the receiving chamber by rollers. One form of the shutter consists of two slides, one of which slides above the other; the lower slide has an exposure aperture which passes in front of the lens aperture, and is then covered by the upper slide. A spring catch is fitted for holding the shutter open for slow exposures. The shutter is preferably fitted between the lenses, and actuated by spiral springs. In another form of the shutter a rotary disc, with several apertures to give a succession of exposures, is used.

5,458. *April 10th*, 1890.—"Cameras and Change-Boxes." H. R. Hume, 6, Allen Terrace, Kensington High Street, and E. W. Parfitt, 18, Gatcombe Road, Tufnell Park, both in London.

In a detective or hand-camera, plates, enclosed in sheaths having side projections at one end, are placed in a receptacle at the top of the camera, the plates being pressed towards the bottom by a spring. Within the camera, and below the receptacle, slides a carriage having racks on the top, on to which the projections drop in succession. The carriage is slid towards the back by a lever at the base of the camera, which lever actuates a sliding plate provided with a spring pin, which engages with recesses in the sliding carriage. When the lever is moved towards the front of the camera, the pin is withdrawn from the recess. The lever also works a ratchet indicator. As the front ends of the plates drop in succession from the ledge, they are held by a spring in a vertical position for exposure.

Leeds Photographic Society.—The hon. sec. of the above Society, Mr. S. A. Warburton, informs us that, in connection with the Photographic Exhibition which is to be held in the Municipal Art Galleries during the coming winter, in addition to the medals offered by the Fine Art Gallery Committee, the Committee of the Leeds Photographic Society have decided to offer the following special medals for competition amongst its own members:—One silver medal to be awarded to the exhibit which the judges may deem most worthy of the distinction; six bronze medals to be awarded as follows:—(1) Landscape; (2) figure subjects, including portraits; (3) architecture (exteriors and interiors); (4) instantaneous; (5) lantern slides; (6) enlargements. No special form of entry is required for the competition beyond advising the secretary that it is intended to exhibit, when all pictures coming within the above classification sent in to the Exhibition, by members of the Leeds Photographic Society, will be deemed eligible to compete for the above awards, which will be made quite independently of and in addition to any honours gained in the open Exhibition.

## Proceedings of Societies.

### Holborn Camera Club.

*September 4th.*—Mr. E. H. Bayston presiding. The subject for discussion was "Architecture (Exterior and Interior)."

Mr. Fred. Brocas opened the discussion on exterior architecture, which, he said, might mean a doorway, or a gateway, a house, or Westminister Abbey. It did not appear difficult, but there were certain rules to be observed, among the chief being, "never get directly opposite the subject." He then showed various photographs demonstrating this axiom. Another was that the camera should be perfectly level. He also gave some excellent hints which experience had taught him during his life as a camera-man.

Mr. Golding then gave his experience in taking interiors, which he characterised as the most difficult branch of photography. One of the chief difficulties was the exposure, which would differ in every interior taken. Experience alone would enable one to gauge the right exposure. Slow and thickly coated plates were best. The plate must be backed, or halation would certainly be present in the resulting image. Backing does not do away with halation altogether, but it does certainly lessen the evil. A good backing was a piece of insensitive carbon tissue, preferably black, soaked in weak glycerine, and then squeegeed on the back of the plate. It could easily be stripped off before development and used over and over again. He thought it was a mistake to get the whole of the interior of a church on the plate. A mass of detail is lost in this way, which is, perhaps, the most interesting part of an interior. With regard to exposure, the rule is to expose for the shadows, and not to make it too short. He had found Watkins' actinometer of some use to him in arriving at the right exposure. Another important matter was judicious and cautious development. He used pyro and ammonia, and commenced with the following:—$\frac{1}{2}$ grain of pyro, 1 grain bromide, and $\frac{1}{2}$ grain ammonia to every ounce of developer. When the high-lights begin to show, coax detail out with ammonia, then add pyro, and obtain sufficient density. He showed an excellent 12 by 10 interior, illustrating various points in his remarks.

### Lewes Photographic Society.

The annual meeting was held at the Fitzroy Institute on Tuesday evening. Mr. J. G. Braden occupied the chair, and the attendance included Alderman White, Councillor Wightman, Mr. E. J. Bedford (hon. sec.), Mr. C. A. Wells, Mr. J. Farncombe, jun., Mr. E. H. Fuller, &c.

Mr. George Carpenter was elected a member of the Society.

Mr. Bedford then read the annual report of the council, which expressed pleasure at the continued prosperity of the Society, and went on to say that four new members had been elected during the year, and three had resigned, leaving forty on the books. Ten ordinary meetings had been held during the year, at which interesting papers were read, and demonstrations given. The council called attention to the quarterly competitions, which have been established to promote friendly competition and criticism of members' work, and which the council also venture to think would tend to individual progress and improvement. The excursions, taking into consideration the unfavourable weather experienced during the season, had been very well attended. The exhibition of members' work held on January 28th brought together a very interesting collection of photographs, &c., and was a success, although, owing to the weather, there was a financial deficit. A bookcase having now been purchased, the council hoped that a library might soon be formed, and would be glad to receive books or pamphlets from members or others towards its formation. The treasurer's report was satisfactory, showing a balance in hand of £1 19s. 4½d., notwithstanding a deficit of £3 9s. 9d. in connection with the exhibition, and also several heavy items in the expenditure, which would not occur another year.

The election of officers was then proceeded with as follows:—*President*—Mr. J. G. Braden; *Hon. Secretary* and *Treasurer*—Mr. E. J. Bedford; *Vice-President*—Mr. Tunks; *Committee*—

Messrs. W. B. Funnell, E. Miller, P. Morris, G. J. Wightman, and H. B. Constable, the last-named gentleman being appointed in the place of Mr. C. R. Wells (resigned).

The set of hand-camera pictures by Mr. Percy Morris, which gained a silver medal at the Cardiff Photographic Exhibition, were on view in the room, and were much admired.

During the evening certificates were presented to Mr. W. Young for enlargements, and Mr. J. Tunks for lantern slides.

---

Richmond Camera Club.

*September 4th.*—Mr. Hunter presided. Mr. Richardson showed an actinometer of his own make for timing the printing of platinotype and carbon prints, &c.

The subject for discussion was "Testing Lenses." Mr. Ardaseer explained the mode of testing for faults in mounting and grinding, and the colour of the glass, and for iridescence, bubbles, flare-spots, "ghosts," spherical aberration, non-coincidence of visual and actinic foci, curvilinear distortion, astigmatism, flatness of field, and covering power.

Mr. Cembrano added some remarks on polish and striation, and the importance of accurately measuring the focal length of the lens and the apertures of the stops, and showed some plates which he had exposed to test covering power.

Outings took place on the 22nd ult. to Cobham, and on the 5th inst. to Pinner, with fine weather on each occasion.

---

Leeds Photographic Society.

The first meeting after the summer vacation was held on the 1st. inst., Dr. Jacob in the chair.

The evening was devoted to an exhibition of negatives, prints, &c., taken during the holidays. Amongst the exhibits the following may be mentioned: Mr. Robert Bownas, aristotype prints ; Mr. T. Butterworth, a fine collection of 12 by 10 prints in silver and Obernetter paper ; Mr. A. R. Dayson, hand-camera views ; Mr. Herbert Denison, 7½ by 5 and hand-camera prints on Obernetter and platinotype ; Mr. E. Kinsley, half and whole-plate Obernetter prints ; Mr. A. A. Pearson, a large collection of hand-camera views of Whitby and neighbourhood ; Mr. R. W. Savage, Obernetter and matt surface prints ; Mr. H. S. Walker, negatives of Derwentwater, &c. ; Mr. S. A. Warburton, pictures mounted in optical contact with the glass. A very agreeable evening was spent in discussing the various exhibits and processes involved.

The next meeting will be held on the 21st instant in the Society's room, Mechanics' Institution, when Mr. G. H. Rodwell will give a demonstration of "Lantern Slide Making."

---

Errata.—In Mr. P. H. Emerson's letter on "Perspective Drawing and Vision," in our issue of 28th ult., there are a few printer's errors, which escaped correction by mislay of copy :— 1st line, omit "the"; line 12, for "will," read "theory"; line 16, for "*in*," read "*id*"; line 18, for "say again," read "only agree"; omit comma.

The Hackney Photographic Society's Exhibition is to be held at Morley Hall, Triangle, Hackney, on the 21st and 22nd of October. There is to be an open competition in lantern slides, for the best six of which a silver medal will be awarded ; and there will be also an open class, for any picture by any process, except opals or transparencies, in which the award will be made of a gold, silver, and bronze medal for the three best pictures. The judges will be Messrs. J. Traill Taylor and A. Pringle. Sir Charles Russell, Q.C., M.P., has consented to perform the opening ceremony. In addition to the usual display of pictures for competition, the committee have arranged for popular entertainments, which will include concert and organ recitals, working trade exhibits, optical lantern displays, exhibition of photographic apparatus, &c. The prize distribution will be held on Thursday evening, when four gold, eight silver, and three bronze medals, besides other valuable prizes, will be awarded. Admission each day, one shilling. Further particulars and conditions of exhibition can be obtained of W. Fenton Jones, Hon. Sec., 6, Victoria Street, King Edward Road, N.E.

## Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

J. C. (Northwich).—*Gelatine Plates and Collodion.* 1. Thin, soft negatives with proper exposure should be sufficiently developed in five minutes, but for vigorous subjects requiring greater contrasts, ten minutes might be better. Alum bath, if used at all, need be but a short operation, say one to two minutes. Remember to wash before fixing, and leave the plate in the hypo until all the yellow bromide has been dissolved out. 2. Ten grains of pyroxyline, and five grains each of cadmium bromide and iodide, might be the right proportions for two ounces of collodion, but here again there is room for the exercise of judgment, the composition being varied according to the requirements of the case, and no two samples of gun-cotton are alike, those prepared at low temperatures giving a thicker collodion.

H. D. (Surbiton).—*Pall Mall Exhibition.* See notice given last week. Wednesday next will be the receiving day for frames, lantern slides, and apparatus delivered by hand at the Gallery.

Photargus.—*Black-and-White Work.* 1. Will not a dilute bath of cyanide help you to clear the shadows previous to mercury intensification ? 2. Schlippe's salt, being an alkaline preparation, might not answer so well on a gelatine plate as with collodion, but you should try it. 3. Tincture of iodine will convert a gelatine negative into a yellow picture, but without really adding to its intensity, as we have proved by direct experiments. Another mode of intensification is that mentioned by Mr. W. T. Wilkinson at page 12 of his book on "Photo-Engraving," viz : —

| | |
|---|---|
| Red prussiate ... ... ... ... | 6 parts |
| Nitrate of lead ... ... ... ... | 4 ,, |
| Water ... ... ... ... ... | 80 ,, |

When bleached and washed, the plate is treated with dilute nitric acid, 1 to 80 ; again well washed, and flooded with sulphide of ammonium diluted with five times its bulk of water. Lastly, treat with the same dilute nitric acid, wash, and dry.

Old Stock.—*Cracked Glaze.* You cannot do better than warm the old dishes and rub melted paraffin or white wax into the cracks ; even then such vessels should only be used for inferior purposes. Old glasses are worth looking over to select out the best squares for photographic use or framing, all the rest being drafted off to the horticulturist.

Torres.—*Luminous Paint.* This can still be obtained of Mr. Horne, 6, Dowgate Hill, E.C. It is generally used only as a last coating to save expense.

Len.—*British Association.* The official report of the Cardiff meeting will not be issued until next March or April ; meanwhile the scientific papers are appearing in the *Chemical News*, *Nature*, *Engineer*, *Electrician*, and other class journals, taking special notice of communications interesting to their readers. The *South Wales Daily News* (Cardiff, St. Mary's Street), from 19th to 26th ult., gave good summaries of the general proceedings in the various sections, and to these, or the *Times* reports, you might turn in the first instance for preliminary information.

E. M. (Crewe).—*Eoside of Silver.* The facts are not quite as you have stated, for the eosines and erythrosines always contain chlorine, bromine, or iodine, and these halogens are necessary constituents of the organo-silver compound formed on precipitating an aqueous solution of the colouring matter with nitrate of silver. Fluoresceine can be worked in with the eosines, but not magenta, unless alcohol be employed. Have you tried naphthaline red, "Rose de Magdala"?

Ed. L. Wilson.—Your letter has been sent on to South Kensington.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1724.—*September* 18, 1891.



CONTENTS.

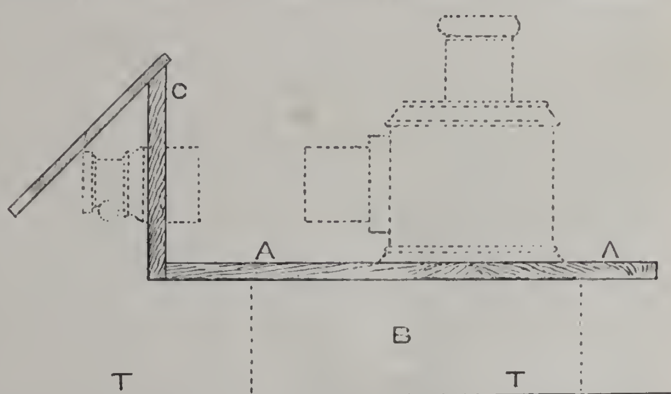


## A NEW USE FOR THE OPTICAL LANTERN.

WITH the increase of schools of art all over the country a knowledge of drawing has become far more common among us than it was twenty or thirty years ago. This is indeed a subject for congratulation, for the practice of art, different from many other pursuits, confers benefit and pleasure upon others besides its professor. Since, too, the invention of several photo-mechanical processes by which drawings can be readily transformed into typographic blocks without the intervention of the engraver, there has been a demand for drawings in black and white such as never existed before; so that all around us we see schools arising which profess to devote themselves to the new branch of graphic ait, and pupils eagerly availing themselves of the profferd instruction. We think, then, that any means which promises a still closer union between the photographer and the draughtsman, and which may tempt the latter to adopt the pencil of the former, cannot fail to have an influence for good. Such a means we wish now to place before our readers, and, although we cannot claim any great originality for the suggestion, we may at least say that it is a new application of an old idea.

It came about in this way. Some time ago we were wishful to obtain some photo-mechanical blocks from certain lantern slides we had at hand. The half-tone processes of the Meisenbach type were obviously out of the question, for the printing had to be done on a quick rotary machine. It was therefore determined that they should be drawn in line on card in the blackest of inks, photographed, transferred to zinc, and etched in the usual manner. But when we came to make the necessary enlarged drawings from the slides, we found that the work was extremely slow and laborious, although we employed proportional compasses and other labour-saving devices. It was then suggested that the slides should be severally placed in a lantern, and that the resulting enlarged image, received upon a piece of card, should be outlined direct in pencil. This we did, but found the work extremely fatiguing, for the cardboard upon which we pencilled the lines was necessarily in a strictly vertical position, and the attitude assumed was so cramped that a frequent rest was demanded.

It was now suggested that things might be much improved if the enlarged image, instead of being projected horizontally, were thrown down upon a table, at which the worker might sit with some degree of comfort. The hint was quickly acted on, and by the same evening we had constructed a rough and ready enlarging




apparatus for draughtsmen, which has since been constantly in use, and which we would not readily part with. It is simply an application of the *camera lucida* principle, which has so long been in use for the drawing of microscopic objects, to the ordinary mineral oil optical lantern, only that, instead of using a prism, we make use of a common mirror.

The apparatus consists of a base-board about seven inches in width, with a ledge at each side, leaving in the centre sufficient space for the lantern to be moved to and fro, while at the same time the ledges cause the image cast to be always central. But the relation of parts will be best understood by reference to the accompanying sectional drawing.

AA is the base-board, made out of inch deal, with a ledge on each side as already stated. It is about seven inches in width and three feet in length, and while in use it is supported on a (lantern) box, B, laid on its side on the table, TT. At one end of this base-board is an upright, C, of the same width (seven inches), pierced in the centre with a four-inch hole so as to carry the front of the lens tube, which is separated from the lantern body by a space which varies with the amount of enlargement or reduction which may be required. At the top, this vertical board is bevelled to an angle of 45°, and by means of wooden buttons a piece of looking-glass, face downwards, is fixed at that angle. This glass is large enough to cover the lens front, so that the image of the picture on the stage is intercepted and cast upon the table below, upon which a sheet of cardboard is placed to receive it. A piece of ordinary looking-glass is employed—in our case we actually use a hand toilet-glass—and although theoretically such a glass, not silvered on the surface, should cast a double image, in practice it is found that no secondary image is perceptible. Indeed, so free is the reflection given from this difficulty that the arrangement might with advantage be employed for making reversed negatives.

A lantern can be used in this way by daylight provided that the window-blind is pulled down, so that the picture thrown upon the cardboard is not eclipsed by the brighter light. There is, indeed, an advantage in working under such conditions, for the lines of the picture may be traced over in pencil, while, at the same time, the artist can watch the growth of his own work. There is also an advantage in shutting off the lantern light every now and then, so that progress may be reported the more effectually. It is obvious that the lantern employed in this way will give a reduced image as well as one which is larger than the original. But, in this case, it will be found necessary either to reduce the size of the support upon which the base-board stands, or to raise the cardboard upon which the image is cast. The apparatus as shown is, of course, but a makeshift, and a far more perfect contrivance can be readily constructed by anyone with a little ingenuity in his composition. Such an improved instrument would compromise a mechanical movement for altering the height of the lantern, as well as a rack-work for moving it from and towards the front lens. There are many other points which will doubtless be suggested by those who care to give time and thought to the matter. We place the idea before our readers in a roughly hewn state, and will leave them to cut down its angles and polish it up generally according to their individual tastes.

We need hardly point out that with a more powerful source of light—such as the oxyhydrogen light—the lantern can be used for tracing pictures of far larger size. In this form it should be most useful to artists for making rough sketches upon canvas or paper. We have also often suggested that scene-painters should call in its aid to help them in sketching out their designs in charcoal, instead of squaring both drawing and canvas in the usual manner. Messrs. Perken, Son, and Rayment are about to bring out a lantern sketching arrangement on the lines indicated in this article.

## DEVELOPIANA.

BY C. BRANGWIN BARNES.

However nicely a picture may be posed and lighted, and however exact may be the exposure, the whole effect may be absolutely marred by injudicious or careless development. Most operators have a pet formula of their own, in some cases closely assimilating to that issued with the particular brand of plates in use, and in others totally dissimilar. It should, nevertheless, be borne in mind that different subjects and different exposures require a different mode of development. A negative that requires reduction or intensification is never the equal of one that has been correctly developed, however carefully the intensification or reduction has been done, and, therefore, it should be our main aim to produce negatives that do not require either of these processes. The system which has latterly gained ground in large businesses of developing two or more plates at once is, on the face of it, a bad one. I have personally, when pressed for time, developed as many as thirty quarter-plates in a batch, but am compelled to admit that, had each plate been developed separately, they would have been better.

Good results may be obtained with almost any standard developer—*i. e.*, as regards the stock solutions—with the exception of those wherein the bromide and the ammonia are mixed; the only requisite being to dilute and mingle these stock solutions with care, and bearing in mind the treatment the plate has received beforehand. For example, take a plate which has been exposed upon a lady in light drapery, and which is believed to be exact as to exposure; a normal developer may bring about a successful result, but if the development be started with less bromide than usual, there will be all the more chance of obtaining a soft and harmonious picture. The materials composing the pyro developer are cheap enough, and yet many use the same solution for two or three plates, whereas others who wish to obtain the best result the plate will give sometimes use two, or even three, separate lots of solution on one. If a negative comes up thin and lacking in brilliancy, it is usually recommended to add more pyro or bromide to the developer which is being used; but a much better result will be obtained by throwing off the old solution altogether, and pouring on some fresh in which the proportions of pyro and bromide are stronger. If, on the other hand, the *cliché* is developing with too great a contrast, the solution should be thrown off as before, and development continued with a fresh lot in which the pyro and bromide are much weaker, and the ammonia proportionately stronger. If the drapery develops with full strength, and the face—from being brown, or from any other cause—is thin, local density can be obtained by pouring the developer back into the measure, and then direct on to the weak part, repeating the operation until the required amount of density is obtained.

It is astounding how many of the little tricks which used to be so successful with the old wet collodion plate will prove themselves equally so with the dry gelatino-bromide. An underdone wet plate used always to be exposed to the yellow light of the dark room window for some seconds; yet how few think of doing the same with the dry plate! Let those who have never tried the experiment do so, and they will be astonished at the vast amount of detail it will bring out; and when I say detail I do not mean fog, but detail exactly the same as would have been obtained by a prolonged exposure. Think of this when a cross baby or a restive animal is to be taken, and any negative of which you have the slightest suspicion as regards fulness of exposure, hold up to your dark room window for twenty or thirty seconds before you develop, and then proceed as for a fully exposed plate. Sulphite of soda in the developer acts, to a certain extent, as a restrainer, and whenever it is used care should be taken in apportioning the bromide, or the result will be a negative which, while it assimilates in colour to the old wet plate, will have very harsh lights and clear shadows, very much after the style of a bad flash-light picture.

The mention of flash-light pictures reminds me that winter is at hand, and that ere many months—or very many weeks, for matter of that—are gone, the flash-lamp will be in use again. Already the shades of evening come upon us so early that those of us who have no flash-light apparatus are often compelled to send a late sitter away. However, I opine that the coming winter will see the apparatus in nearly every studio except those which have an electric light installation; and, if not out of place in such an article as this, I would advise all intending purchasers to avoid spirit lamps. I have used James's lamp, in which the magnesium is burned in a gas flame, for the past three winters, and have been more than satisfied with the results. One reason for speaking of flash-lamps is that pictures taken by their aid require some considerable modification of the developer, and probably the easiest way of effecting this is to use just half the usual quantity of bromide in the stock solution. A formula which I have found very useful for this class of picture is the following:

| | | |
|---|---|---|
| A.—Pyrogallic acid (Schering) | ... ... | 1 ounce |
| Bromide ammonium or Bromide of potassium | ... ... ... | $\frac{1}{2}$ ,, / $\frac{3}{4}$ ,, |
| Water ... | ... ... | 7 ounces |
| B.—Ammonia | ... ... | 1 ounce |
| Water ... | ... ... | 40 ounces |
| C.—A | ... ... | 1 ounce |
| Water ... | ... ... | 20 ounces |

To develop, take equal parts of B and C, which will, in ordinary cases, ensure a soft and well graduated negative, although different proportions of B and C will be required for under-exposed or over-exposed plates, or for subjects introducing white draperies, or dead black dresses, &c. The judgment of the operator will, in most cases, tell him what proportions are required, and if the first appearance of the image should prove he has miscalculated, he should not try to improve the solution he is using, but throw it away and commence again with fresh.

One last word, and that is, to obtain clean negatives, the measures and dishes in use for developing must be kept clean; water alone is not sufficient for this purpose. They should be occasionally cleansed with dilute hydrochloric or nitric acid, preferably the former.

---

The Photochronograph. — Rev. George A. Fargis, S.J., assistant director of the Georgetown College Observatory, at Washington, D.C., has invented an instrument which he calls the photochronograph, and which he claims to be capable of registering the time of star transits to the one-thousandth part of a second. Should his instrument prove thoroughly accurate and reliable, as is believed it will, he will have the satisfaction of having taken a long stride toward the perfection of photographic records.—*Anthony's Bulletin.*

## THE RATE OF EXPLOSIONS IN GASES.*

The use of compressed gases is now so much identified with photographic work, that the following abstract of a paper brought recently before the Royal Institution of Great Britain by Professor Dixon, F.R.S., of Owen's College, Manchester, cannot fail to be of interest to many of our readers.

The rapid act of chemical change which follows the kindling of an explosive mixture of gases has of late years attracted the interest both of practical engineers and of theoretical chemists. To utilise for motive power the expansive force of ignited gases; to minimise the chance of disastrous conflagrations of fire-damp in coal-mines; to follow the progress of chemical changes under the simplest conditions, are some among the problems presented to us in industry or science, demanding for their solution a knowledge of the phenomena of the explosions of gases.

To understand the nature of explosions in gases, it is necessary to know certain fundamental properties of the explosive mixture. With this object in view, experimenters have sought to determine for various mixtures of gases—the heat of chemical combination, the temperature of inflammation, the pressure developed, and, lastly, the rate at which the explosion is propagated under different conditions.

It is on the last of these problems—the determination of the velocity with which the flame travels through the gas—that I have been asked to speak.

Twenty-four years ago Bunsen described a method of measuring the rapidity of the flame in gas explosions. Passing a mixture of explosive gases through an orifice at the end of a tube, and igniting the gases as they issued into the air, he determined the rate at which the gases must be driven through the tube to prevent the flame passing back through the opening and exploding inside the tube. By this method he found that the rate of propagation of the ignition of hydrogen and oxygen was thirty-four metres per second, while the rate of ignition of carbonic oxide and oxygen was less than one metre per second. Bunsen applied these results to the rate of explosion of gases in closed vessels, and his results were accepted without cavil for fourteen years.

By 1880 facts began to accumulate which seemed inconsistent with Bunsen's conclusions. For instance, between 1876-80 I had several times observed that the flame of carbonic oxide and oxygen travelled in a long eudiometer too quickly to be followed by the eye. Mr. A. V. Harcourt, in his investigation of an explosion which happened in a large gas main near the Tottenham Court Road in 1880, was led to the conclusion that the flame travelled at a rate exceeding one hundred yards per second. In the winter of 1880-1 I noticed the rapid increase of velocity as a flame of carbon bisulphide with nitric oxide travelled down a long glass vessel; and shortly afterwards I attempted to measure the rate of explosion of carbonic oxide and oxygen by photographing on a moving plate the flash at the beginning and end of a long tube. The two flashes appeared to be simultaneous to the eye, but no record of the rate was obtained, for the apparatus was broken to pieces by the violence of the explosion.

In July, 1881, two papers appeared in the *Comptes Rendus*, one by M. Berthelot, the other by MM. Mallard and Le Chatelier. Both papers announced the discovery of the enormous velocity of explosion of gaseous mixtures.

* *Chemical News.*

Other papers quickly followed by the same authors. M. Berthelot made the important discovery that the rate of explosion rapidity increases from its point of origin until it reaches a maximum which remains constant, however long the column of gases may be. This maximum M. Berthelot states to be independent of the pressure of the gases, of the material of the tube, and of its diameter above a small limit. The rate of explosion thus forms a new physico-chemical constant, having important theoretical and practical bearings. The name "L'Onde Explosive" is given by Berthelot to the flame when propagated through an explosive mixture of gases at the maximum velocity.

While Berthelot, associated with Vieille, was measuring the rate of the "explosion-wave" for various mixtures of gases, Mallard and Le Chatelier continued the study of the preliminary phenomena of explosion which precede the formation of the "wave." They showed, by photographing on a revolving cylinder—(1) that when a mixture such as nitric oxide and carbon bisulphide is ignited at the open end of a tube, the flame travels a certain distance (depending on the diameter and length of the tube) at a uniform velocity; (2) that at a certain point in the tube vibrations are set up which alter the character of the flame, and that these vibrations become more intense, the flame swinging backwards and forwards, with oscillations of increasing amplitude; and (3) that the flame either goes out altogether, or that the rest of the gas detonates with extreme velocity. Again, when a mixture of gases was fired near the closed end of the tube, they found the velocity of the flame regularly increased, as far as their instruments were able to record the rapidly-increasing pace.

Mixtures of coal-gas with air, and of fire-damp with air, show phenomena of the first and second kind. Ignited at the open end of a tube, these mixtures burn at a uniform rate for a certain distance, and then the flame begins to vibrate.

The vibrations acquire greater or less velocity according to the nature of the mixture and the conditions of the experiment; but the third *régime* of uniform maximum velocity is not set up. In narrow tubes the explosion soon dies out.

The phenomena studied by Mallard and Le Chatelier have been observed on a large scale in explosions in coal mines. It has been noticed that little damage was caused at the source of an explosion, and for a distance varying from fifty to eighty yards from the origin of the flame, while beyond that distance fall of roof, broken tubs, and blown-out stoppings have testified to the violence exerted by the explosion. Great as the destruction is which an explosion of fire-damp and air causes in a mine, it is fortunate that these mixtures do not *detonate*.

Passing on to Berthelot's researches on the *régime* of detonation, I will briefly summarise the results he has arrived at. The actual velocities of explosion are compared by Berthelot with the mean velocity of translation of the gaseous products of combustion, supposing these products to contain all the heat that is developed in the reaction. For instance, we know the total heat given out when hydrogen and oxygen combine. If this heat is contained in the steam produced, we can calculate what its temperature must be if we know its heat capacity; and if we know the temperature of the steam, we can calculate the mean velocity with which the molecules must be moving. Now Berthelot supposes that the heat is all contained in the steam produced. He assumes that the heat capacity of steam is the same as the sum of those of its constituents; and he supposes, moreover, that the steam is heated at constant pressure. Making these assumptions, he calculates out the theoretical mean velocity of the products of combustion of various mixtures, and finds a close accordance between these numbers and the explosion rates of the same mixtures. He concludes that the explosive wave is propagated by the impact of the products of combustion of one layer upon the unburnt gases in the next layer, and so on to the end of the tube at the rate of movement of the products of combustion themselves. If his theory is true, it accounts not only for the extreme rapidity of explosion of gaseous mixtures, and gives us the means of calculating the maximum velocity obtainable with any mixture of gases, but it also affords us information on the specific heats of gases at very high temperatures, and it explains the phenomena of detonation, whether of gases or of solid or liquid explosives.

Table I. shows the explosion rates found by Berthelot, compared with the theoretical velocity of the products of combustion. Two points in Table I. favoured the view that Berthelot might have here given the true theory of explosions: first, the close coincidence between the rates of explosion of hydrogen, both with oxygen and nitrous oxide, with the calculated mean velocities of the products of combustion; and secondly, the great discordance between the found and calculated rates for carbonic oxide with both oxygen and nitrous oxide. I had previously discovered that pure carbonic oxide cannot be exploded either with pure oxygen or pure nitrous oxide. The discordance found by Berthelot was what I should have expected from my own experiments.

A consideration of Berthelot's results, published in full in the *Annales de Chemie*, led me to think it would be useful to repeat and extend these experiments. My objects were chiefly—(1) to determine as accurately as possible the rate of the explosion-wave for some well-known mixtures; (2) to measure the rate of the explosion-wave in carbonic oxide with different quantities of steam; and (3) to determine the influence of inert gases on the propagation of the wave.

Table I.—*Berthelot's Experiments.*

| Gaseous Mixture. | Velocity in Metres per Second. Theoretical. | Found. |
|---|---|---|
| $H_2 + O$ Hydrogen and oxygen. | 2830 | 2810 |
| $H_2 + N_2O$ Hydrogen and nitrous oxide. | 2250 | 2284 |
| $CO + O$ Carbonic oxide and oxygen. | 1940 | 1090 |
| $CO + N_2O$ Carbonic oxide and nitrous oxide. | 1897 | 1106 |
| $CH_4 + O_4$ Marsh gas and oxygen. | 2427 | 2287 |
| $C_2H_4 + O_6$ Ethylene and oxygen. | 2517 | 2210 |
| $C_2N_2 + O_4$ Cyanogen and oxygen. | 2490 | 2195 |
| $C_2H_2 + O_5$ Acetylene and oxygen. | 2660 | 2482 |
| $CO + H_2 + O_2$ Carbonic oxide, hydrogen, and oxygen. | 2236 | 2008 |

*(To be continued.)*

## ON THE SPACE-PENETRATING POWER OF LARGE TELESCOPES.*

BY A. C. RANYARD.

Unless there is some small star or dimly shining body with a large parallax which has not yet been detected, our nearest neighbour amongst the stars is the double star α Centauri. It is situated about 30° from the southern pole of the heavens, and therefore is not visible in England. The two stars together shine with a light which is a little greater than that of a first magnitude star, for the larger of these twin suns is ranked by Prof. Gould as being exactly of the 1st magnitude of the photometric scale, and the smaller star is of the 3½ magnitude.

According to this photometric scale of magnitudes, which is now universally used, a star of the 1st magnitude gives just 100 times as much light as a star of the 6th magnitude. Consequently, if the larger star of the pair, which is known as $\alpha^2$ Centauri, were removed to ten times its present distance, it would appear as a star of the 6th magnitude; but this would only be the case if there were no loss of light in travelling from its more distant position. If there were any absorption of light in passing through such a vast distance of space, it might appear smaller and would probably not be visible to the naked eye, for few people see stars with their unaided eyes which are ranked as smaller than the 6th magnitude. According to the photometric scale, a star of any magnitude gives about 2½ times as much light as a star of the magnitude immediately below it. Thus, a star of the 6th magnitude gives 2·512 times as much light as a star of the 7th magnitude, and a star of the 7th magnitude gives 2·512 times as much light as a star of the 8th magnitude. Consequently, a star of the 6th magnitude gives 6·31 times as much light as a star of the 8th magnitude, and 15·85 times as much light as a star of the 9th magnitude, 39·81 times as much light as a star of the 10th magnitude, and 100 times as much light as a star of the 11th magnitude.

Let us suppose that $\alpha^2$ Centauri were removed to 100 times its present distance; then, neglecting the absorption of light in space, it would shine as a star of the 11th magnitude of the photometric scale, and would only just be visible with a telescope of 2½ in. aperture. This calculation is based on the assumption of Prof. C. A. Young ("Text-book of General Astronomy," sec. 822) that, for normal eyes, with a good telescope, the *minimum visible* for a 1 in. aperture is a star of the 9th magnitude—an estimate which about corresponds to what might be expected from the diameter of the pupil of the eye.

I have measured the diameter of the pupils of several persons whom I believed to have keen sight—amongst others, the observing eyes of the Rev. T. W. Webb, Mr. Burnham, and the late Dr. H. Draper—and have found that about ¼ in. generally corresponds to the maximum dilation of the pupil in viewing faint objects. A telescope of 1 in. diameter would, consequently, collect about sixteen times as much light as would enter the pupil of the unassisted eye, and ought, with a suitable eye-piece, to show stars giving about one-sixteenth the light of a 6th-magnitude star just visible to the naked eye. As we have seen above, a 6th-magnitude star gives 15·85 times as much light as a 9th-magnitude star of the photometric scale. Consequently, neglecting the absorption of light by the lenses, and the reflection from their surfaces, a 1 in. telescope ought, with a suitable eye-piece (which collects and sends into the pupil of the eye the whole of the light from the object-glass), to render the stars of the 9th magnitude just visible.

The power used with a telescope makes some difference, as it increases the contrast between the brightness of the star and the background on which it is seen—the light of the background being dimmed by magnification, while the star in a good defining telescope is but slightly dimmed by moderate magnification. Thus, Dawes found that he could see a star of the 6th magnitude with a telescope having an aperture of only 0·15 in. when a power of 16½ was used. In the case of the 1 in. telescope above referred to, the loss of light by absorption and reflection at the surfaces of the lenses seems to be about balanced by the increase of contrast with the background, due to the power employed.

Let us suppose that $\alpha^2$ Centauri were removed to a thousand times its present distance; then, neglecting the absorption of light in travelling through space, it would appear as a star of the 16th magnitude, and would only just be visible with a telescope of 25·12 in. aperture, and if it were removed to 1585· times its present distance, it would shine as a star of the 17th magnitude of the photometric scale, and would only just be visible in a telescope of 39·81 in. aperture. That is, it would not be visible in the great Lick 36 in. refractor.

These calculations are based on the assumption that there is no absorption of light in passing through great distances of space, and also on the assumption that there is no loss of light in passing through such thick lenses. The thickness of the object-glass of the "Washington" 26 in. refractor at its centre is nearly 3 in.; thus, the flint glass lens is there 0·96 in. thick, while the crown glass lens is 1·88 in. thick at its centre. Such a thickness more than halves the intensity of the emergent pencil, and the loss of light by absorption in passing through the glass near the centre of the Lick object-glass must be considerable. Exact measures of the absorption of light by such great lenses would be of much interest. We may, however, probably assume with some confidence that if $\alpha^2$ Centauri were removed to twelve hundred times its present distance it would not be visible in the Lick telescope, even though there were no absorption of light in space, and $\alpha^2$ Centauri is probably larger and brighter than our sun. (Assuming with Mr. Gore a period of seventy-seven years for this binary, and a parallax of ·75 of a second, the sum of the masses of the components will be 2·14 times the mass of the sun.) Stars smaller than our sun would be lost to sight at smaller distances. Consequently, the Milky Way must either be nearer to us than a thousand times the distance of α Centauri, or the smallest stars visible in it with a telescope as large as the Washington 26 in. refractor must be larger than our sun—a supposition at which the mind rebels when we remember the vast size which this would imply for the larger stars evidently involved in or associated with the Milky Way. For example, in the Pleiades group, there are observable with the eye at the telescope a range of some 13 magnitudes of the photometric scale, which, translated into ordinary language, means that the larger stars of the cluster give more than a hundred and fifty thousand times as much light as the smaller stars of the cluster.

In the photographs of the Pleiades cluster we have evidence of a range of at least 15 magnitudes, which

* *Knowledge.*

means that the larger stars give a million times as much light as the smaller stars, and in the photograph of the Coal-Sack region of the Milky Way there is evidence of a still greater range of magnitudes. The star α Crucis, which is of the 1·3 magnitude, is evidently associated with a dense cluster of small stars, branches from which can be traced far across the Coal-Sack region, and extending to a considerable distance over the Milky Way, or into the Milky Way, to the north of α Crucis. We seem to have in this instance evidence of a range of at least 17 magnitudes; and the proof of the connection between the large star and the small stars of the cluster is far stronger than as stated by me in the May number. α Crucis is a double star with components about five seconds apart, and there are several small companions that have been observed in the telescope. In the glass photographs sent me by Mr. Russell, the spurious disc of the large star is, when examined with a magnifier, seen to contain several small stars forming a cluster about the large one. Indeed, in the plate published in the May number, some seven or eight of these small stars may be recognised with a magnifying-glass on the edge of the spurious disc of the large star.

Though the mind may at first be staggered by the conception of stars giving a million times as much light as our sun, we are not in a position to deny the existence of such vast sun-like bodies. Indeed, those who accept the nebula hypothesis as giving the most probable explanation of the origin, or, rather, of the birth of the planets of the solar system, must be prepared to believe that there was a time when the sun had a diameter as large, or nearly as large, as the diameter of the orbit of Neptune. If, before these more than geologic ages of radiation into space, the surface or photosphere of the solar mass did not shine as brightly as it shines now, it must at least have been a nebula with a very definite surface, which, as seen from a distance of a hundred times as great as that of α Centauri, would have presented a disc nearly half a second in diameter. No disc has at present been observed to any star; we may therefore feel some confidence that there is no such vast sun-like body within a distance from us equal to fifty times the distance of α Centauri.

In the forthcoming part of the "Old and New Astronomy" I have shown reason to believe that there is evidence of absorption of light in space, and that we can, from the numbers of the stars of the various magnitudes, make a rough minimum estimate as to the amount of absorption of light in space, due either to a want of perfect elasticity in the light-transmitting ether, or to dark bodies cutting out or obliterating the light in its passage through space. This greatly reduces our idea of the magnitude of the region we can explore with the telescope and with the camera—α Centauri would probably be lost to the Lick telescope if it were removed to three hundred times its present distance—and it also greatly reduces our idea of the distance of the small stars of the Milky Way, and of the scale of the galactic system, as well as of the nebular system and of the system of clusters, red stars, and bright line stars which are so evidently associated with it.

It is not so very long ago that it was generally taught that the nebulæ were galaxies of stars more or less similar to the Milky Way that surrounds us, but so inconceivably remote as to appear, when observed with the largest telescopes, like small spots in the heavens. This theory suited the popular taste, and died hard. It involved the assumption that man could explore, with the instruments at his disposal, a space so immense that the interstellar spaces which we can just measure or guess at are dwarfed into points besides the distance from which light travels to us.

The theory should have been disposed of by the observations of Sir William Herschel, who noted that many nebulæ are evidently associated with stars, and observed that the smaller nebulæ were distributed over the heavens in a manner which shows an intimate connection between them and the brighter stars. He noted that the nebulæ in the northern heavens were clustered in the pole of the Milky Way, and descended like a canopy on all sides, leaving a dark space or channel separating the nebulous region from the rich stellar region of the Milky Way. Sir William Herschel also fully satisfied himself that "there were nebulosities which are not of a starry nature," and from his observations of diffused nebulæ he formed his well-known hypothesis of a diffused luminous fluid which, by its eventual aggregation, produced stars. But he did not proceed to the legitimate deduction from his observations as to the general distribution of nebulæ—viz., that nebulæ which are arranged so symmetrically with respect to the stars must belong to the stellar system, and therefore cannot be assumed to lie at immense distances compared with the distance of the Milky Way stars.

Sir John Herschel extended the observations of his father to the southern heavens, and showed that there was a similar clustering of the smaller nebulæ on the southern side of the Milky Way, and a similar intimate connection between the distribution of stars and the distribution of nebulæ in the southern hemisphere (see "Cape Observations," p. 134); but it was not till 1858 that the obvious conclusion from these observations was drawn by Mr. Herbert Spencer in a remarkable paper on "The Nebular Hypothesis," published in the *Westminster Review*. He remarked: "If there were but one nebula, it would be a curious coincidence were this one nebula so placed in the distant regions of space as to agree in direction with a starless spot in our own sidereal system. If there were but two nebulæ, and both were so placed, the coincidence would be excessively strange; what, then, shall we say on finding that there are thousands of nebulæ so placed? Shall we believe that in thousands of cases these far-removed galaxies happen to agree in their visible positions with the thin places in our own galaxy? Such a belief is impossible."

Mr. Herbert Spencer's paper was not illustrated by charts, and the force of his reasoning was not generally perceived till some ten years afterwards, when Prof. Cleveland Abbé drew attention, in the *Monthly Notices* of the Royal Astronomical Society for May, 1867, to the intimate connection between the distribution of nebulæ in space and stars; and Mr. Proctor, in 1869, constructed some charts on an equi-surface projection, which graphically put his readers in possession of the facts, and carried conviction to all who read his remarks.

The theory that the nebulæ were distint galaxies involved the assumption that light can reach us from regions many thousand times more remote than the stream of stars which compose our own galaxy; and it also involved the assumption that the matter of the universe is aggregated into clusters, separated by immense barren spaces, in which we must assume that there are very few luminous stars, and but few dark stars which would absorb light, as well as comparatively very little opaque matter distributed as meteors are distributed in the region of space we are familiar with.

We have evidence that the greater part of the lucid stars belong to the galactic system, but the large proper motion of some stars, taken in conjunction with their small parallax, affords evidence, as Prof. Simon Newcomb has pointed out, that they will in time pass away from our galaxy. Prof. Simon Newcomb has shown in his "Popular Astronomy" that, making the most liberal assumptions as to the number and masses of the stars of our galactic system, the highest speed which a body could attain if it fell from an infinite distance through such a stellar system would be twenty-five miles a second, a velocity which is certainly smaller than that of many stars. The regions outside our galaxy cannot, therefore, be absolutely barren, but however sparsely luminous stars are distributed through space, if there were no absorption of light in its passage through the ether, and no opaque bodies to blot out the line of distant stars, it would be impossible, as Olbers long ago pointed out, to draw a line in any direction which would not in an infinite universe pass through some luminous star, and the whole heavens ought to shine with the average brightness of such stars.

That the heavens are comparatively dark may, therefore, be taken as proof either that the light-transmitting ether is not perfectly elastic, or that there are numerous dark bodies in space that blot out the light which we should otherwise derive from the more distant parts of the universe.

## TALKING WITH THE STARS.

When Professor George Davidson, of the Davidson Observatory and the Coast and Geodetic Survey, was shown the Paris cablegram saying that au old lady had just died at Spa, leaving 100,000 fr. as a prize to the astronomer, French or foreign, who within ten years shall be able to communicate with any planet or star, he read it through slowly once, then he read it twice more rapidly. Finally, he picked it up, held it at the proper distance from his eyes, and squinted at it just as he would squint at Mercury through his telescope if he wanted to find the big tortoise-shaped spot on its northern hemisphere. "An old lady! au old lady!" the astronomer finally exclaimed. "Now, isn't that a pretty way to treat such a piece of philanthropy as that? Au old lady, indeed! Now, why under the suu do you suppose they keep back her name? I am inclined to believe that some good-looking young man—one of these smooth talkers – has been getting close to her and talking a lot of astronomy into her ear. From the very form her bequest takes I am aware that somebody—Flammarian or some other man—has been talking to her about the proposed triangle. The project is a very curious one, but can be explained quite easily."

Professor Davidson picked up a blue pencil and drew on a white sheet of paper a right-angled triangle. "This that I have drawn," he said, "is the old triangle of Pythagoras. That triangle has a right-angle, and the square built upou the side opposite the right-angle is equal to the sum of the squares built upou the other two sides. The proposition is said to be the fundamental one of geometry. It has been proposed to draw such a figure as that in the Desert of Sahara, or some other great plain, the lines, of course, to be hundreds of miles long, and made so that they would be distinct in the desert sand. One way would be to plant palm trees so that the forests would take the shape of lines in the figure. Certainly, the green of the palms would be so bright in the contrast with the white of the sand that the drawing, when completed, would be plain enough. These are the suppositions that go along with the idea. It is supposed that there are people on some of the planets—at least, on Mars. It is supposed that the people on the planet are civilised and capable of looking through telescopes, and it is concluded that if this is so, they must know the Pythagorean proposition. So, if the people of Mars look through their telescopes at the earth, they will be sure to see that enormous figure ou the desert, and, seeing it, they will realise that the earth is inhabited by men of knowledge, and that the drawing is a signal; then, of course, they will set to work to answer it by building just such a figure on Mars. That will be talking from star to star.

"But all this is bosh and nonsense to me, and I daresay it was bosh and nonsense to the man who wheedled the Frenchwoman into setting aside her 100,000 fr. But whoever he was, he knew on which side his bread was buttered, and knew that such a trust, for whatever purpose, would bear interest; but even supposing that the Desert of Sahara is one great plain, and that it is large enough for the purpose, and even supposing that it was possible to make such an enormous figure, I am in doubt whether the people on Mars, with such telescopes as we use, would be able to see it. At certain times, Mars is but 34,000,000 miles from the earth; but it gets further and further away, until the distance is 61,800,000 miles. That is a good way off to see triangles; but if Mars is inhabited, I am inclined to believe that the inhabitants are not fools. If they saw a triangle-shaped object on the face of the earth, they would not jump to the chimerical conclusion that there were idiots enough down here to build such an affair. The truth is, we do not know whether any of the planets besides the earth are inhabited. We think we know that it might be possible for men to live on Mercury. The situation and condition of things on the other planets are altogether different from those on the earth. So when we talk about the inhabitants of the planets we enter the realm of surmise, and M. Jules Verne has a better chance than the scientist. The four planets nearest the suu are Mercury, Venus, the Earth, and Mars. Mercury is only 35,392,000 miles from the suu, which is not very far when you take the heat into consideration. Consequently, we believe it is a good many times hotter than Arizona on Mercury. There are other disadvantages, such as a lack of space, enormous mountains, and no certainty of atmosphere. Mercury is only 3,060 miles in diameter, yet there are mountains on its surface over twelve miles high.

"Venus is 66,134,000 miles from the sun, and is plenty hot enough, although nearly twice as far as Mercury from the great heater. Then there is some question about the atmosphere as yet, and the year is only 224 days long. The earth comes next, being 91,430,000 miles from the sun. After this planet is Mars, 139,311,000 miles from the luminary. All astronomers admit that if people like those ou the earth live on any of the other planets, Mars is probably the one. The reasou why is easy to tell. Although Mars is further from the sun than the earth, his orbit is so eccentric that at certain times he is only 126,318,000 miles away; consequently, the temperatures are likely merely a little more moderate than those ou the earth. Then, too, the diurnal motion of the two planets is about the same, so that from one year's end to another the distance from the earth to Mars varies only from 33,800,000 miles to 61,800,000 miles. Mars has its seasons and its polar ice just like the earth. Through the telescope we can watch icefields at the poles get larger as winter approaches, and see them get smaller again in the summer. Mars has an atmosphere and clouds like those on earth. There are continents and oceans ou Mars, so that, altogether, the analogy between that planet and the earth is very close, the striking difference being that Mars is much the smaller. Astronomers are more and more disposed to believe that Mars is inhabited. You ask me if we know, however, and I promptly tell you we do not. An astronomer named Schiaparelli claims he is able to see a double line of canals on Mars. These must be enormous works if he can see them, and must represent a stupendous amount of work on the part of an almost countless number of people. I cannot see them through my telescope, and many others fail. After all, these canals may be in Schiaparelli's eye. People get what is called astigmatism now-a-days, and see two pencils where there is only one. Perhaps that is what Schiaparelli has. But even if there are people on Mars, and even if they have built canals, as for talking with them" (and the professor repeated the statement to make it more positive), "as for talking with them, nonsense!"—*San Francisco Examiner.*

## Notes.

Sulphide of ammonia is a compound which was happily better known to a past generation of photographers than to those of to-day, its chief use being for intensifying wet plate negatives. We say happily, for the smell of the compound is of such a terrible nature, hovering between the odour of ammonia proper and eggs of advanced decomposition, that it is not a very pleasant thing to handle. We remember, some years ago, at a political meeting, some rascal quietly emptied a bottle of the mixture on the floor, a proceeding which quickly dispersed the greater part of the audience. We note that the suggestion was made the other day to the Paris mob that small bombs filled with the liquid should be used in the Paris Opera House on the occasion of the production of Wagner's "Lohengrin," but we are glad to learn that this mischievous advice was not acted upon.

Some months ago, when the automatic photographic machines first made their appearance, we were asked whether this new form of labour-saving device would not have a very disastrous effect upon the interests of photographers. We replied that our correspondent need be under no alarm, and briefly gave our reasons for thinking so. Our views were speedily borne out by the failure of the machines, except under expert management, to fulfil the promises made for them by their godfathers and godmothers—the general newspapers. (The photographic press, it will be remembered, was carefully excluded from the invitations issued by the Company to see the machines at work.)

But it would seem that, although there is nothing to fear for the present from any automatic bogey, there are photographers who undertake to work at such ridiculously low prices that they must exercise a bad influence upon business generally. As an example of this, we refer to the contents of a card placed prominently in a photographer's window which we have seen this week, and have copied *verbatim*. We do not give the name or address, for we do not care to advertise one who works at such cutting prices. "C.D.V., three for one shilling; six for two shillings; or twelve for four shillings." To make a negative and to print from it three positives for a total sum of one shilling, including retouching, spotting, and mounting, cannot, we should imagine, leave much margin for profit. And we need hardly say that the specimens shown were not very grand examples of photographic art. Possibly the secret of the mystery may be found in the contents of the other window of the shop in which they were exposed, which contained an assortment of the articles usually found in a small grocery store. The camera may be used as a bait to secure customers for tea, sugar, bacon, and candles, and perhaps the enterprise may pay in the long run. For all this, such a lowering of the art is to be much deplored.

The aid of the newspapers as a medium for puffing is once more exemplified in a paragraph going the rounds to the effect that somebody has discovered that, by placing a card covered with Balmain's luminous paint in a camera, a phosphorescent picture may be produced. This "new discovery" is as old as the hills, and such luminous pictures have been produced not only in the camera, but by a short exposure behind a transparency. If we mistake not, portraits on glass backed by a phosphorescent surface were introduced commercially at least ten years ago. What a pity it seems that modern workers will not read up the history of what has already been done, so as to save themselves the trouble of re-inventing old ideas.

Our enterprising contemporary, *Woman*, is giving portraits of its readers drawn from photographs submitted to its professor of physiognomy for delineation of character. We have nothing to say against the idea, but should much like to know the meaning of the following guarded observations. "Unfortunately," says the editor, "photography is a fickle and uncertain agent. It often happens that a portrait only just suggests the likeness and character of the subject, so that we have been deprived of publishing a large number of portraits of readers of apparently strong types of character, whose photos make pretty pictures, more than distinct likenesses. Our artist can only deal with those in which the features are clearly and firmly delineated." We must confess we do not quite understand this, unless the explanation is to be found in the hint at the end. Have some of the photographs been of the "fuzzy" type so dear to the advanced school of photographers; have the sitters moved, or has the retoucher's pencil been at work obliterating all the salient points which go to make up character in a portrait? If the latter be the case, *Woman* should have said so boldly. An adverse opinion expressed by such an authority might have had a beneficial effect. It is very certain that nothing irritates the draughtsman who has to reproduce a photograph so much as a portrait of the Book-of-Beauty *papier maché* tea-tray variety.

An interesting record of the House of Commons is in preparation. It consists of four volumes, containing the portrait of every member returned to the present Parliament. A society journal, in announcing the fact, gravely says, "We are assured that by the new process of photognezzotype (*sic*) the reproduction of the photographs will be permanent." "Photognezzotype" is distinctly good. We have never heard of it before, but if we might hazard a guess with the assistance of the French language, it should mean photographs of the members' noses!

Some curious ideas as to the use of photography by the police prevail in the City. A friend, a few nights ago, had the misfortune to be locked in his office through the occupants of the shop on the ground floor leaving without ascertaining whether anybody was in the house. He managed to escape by lowering out of the window to a passer-by the key of the padlock which the regulations of the City impose upon householders to fasten on all outer doors. Relating the circumstance to the shopman, who the next morning was full of apologies, he remarked that it gave him no trouble to get out. "Ah! but it might have given you a little trouble afterwards if a policeman had unlocked the padlock. He would have been obliged to have taken you to the station, where you would have had to have given your name and address, and perhaps while you were talking they'd have taken your portrait. Everybody is photographed as is taken to a police station, though they don't know it." As the man was perfectly serious, he evidently believed he was speaking the truth. Our friend does not think the photographic acquirements of the police have yet reached this length, nor do we.

## SPHERICAL ABERRATION.

BY T. R. DALLMEYER.

It is surprising that this simple subject, confronting one at the very outset of the study of theoretical optics, should still be put forward as a matter of such uncertainty as to necessitate further discussion.

When Mr. Burton says (in italics), "It would be very easy to prove anything I wanted to prove," argument with him becomes an impossibility, for from his standpoint he must be always right or never wrong.

I have looked up Mr. Burton's former letter (and my reply thereto) and compared it with the present one, and am glad to find that he now understands the correspondence of distances before or behind the plane of average focus in their true bearing, viz., the reverse of his previous statement. As to the drawing, it looks pretty, but is worthless in its bearing on the subject. That the areas of circles are dependent on the squares of their radii is familiar to a novice in geometry, but what does it matter in a *drawing* if the *boundary lines* of equal or unequal areas are represented, so long as they cross the axis at the proper positions in the locus of longitudinal aberration? *The longitudinal aberration increases or diminishes as the square of the diameter of aperture.*

Mr. Burton misses the mark when he loses sight of this fact, and that, practically speaking, there is a definite measurable area of the lens near the axis exhibiting no measurable aberration at all, light from the whole of this area being concentrated at the apex of the axial cone—the area of the base of this cone being determined by the amount of positive spherical aberration in the entire system or lens—in a single point. When this aperture is exceeded and aberration is traceable, every measurable area, however small, has a focus nearer and nearer the lens, the further the zone is removed from the base of the axial cone, until the extreme zone of full aperture is reached. The focus of this zone determines the limit of the locus towards the lens, the distance between this and the axial cone determining the locus of longitudinal aberration. In short, when spherical aberration is present, there is a definite measurable aperture free from practically measurable aberration, which we will call the aplanatic cone of rays; and when this is passed, and the spherical aberration becomes measurable or visible, every infinitely small area of increase of aperture has a focus of its own along the locus of longitudinal aberration.

The apex, then, of the axial aplanatic cone is the position of greatest concentration theoretically and practically, and is the best focus, unmistakable to a practised eye, either on contrasted subjects of light on dark grounds, or *vice versa*. The remaining zones, however small, have no collective focus on the axis, but each a separate one that forms out-of-focus zones around the concentrated focus of the axial aplanatic cone.

I hope Mr. Burton will now see the absurdity of placing his focus midway in the locus of longitudinal aberration as "fair."

The first of all tests (known to every astronomer) is the observance of a point of light, or a flame, when focussed for; if the structure is still maintained outside the focus with the halo around it, positive spherical aberration is present; and if the reverse, negative. It is the maintenance of structure that is the real test, and this is best visible at the apex of the axial cone corresponding to a central portion only of the lens if aberration is present.

Now, a word as to the conclusions to be drawn from Mr. Burton's observations, that he invites readers to draw for themselves. In the best visual images formed by an accurate observer, there is no difference, theoretically or practically, between the two classes, viz., a dark object on a bright ground, or a bright object on a dark ground. There is one and only one position of focus to show the structure in the best possible degree.

What Mr. Burton describes as "personal equatiou" in focussing, I should term want of practice in accurate observations. There are two reasons why the practical results are not absolutely identical with the visual, one general, the other particular in their application.

The general reason I have already explained in the paper contributed on this subject to the Camera Club Conference. In photography a dark object on a light ground, particularly in the case noted by Mr. Burton, of "fairly ample exposures," the printed results in this case (hastily prepared in collotype) were in certain instances not in keeping with the original visual impression; the negative obtained, however, showed the structure, by careful examination, sufficiently clearly to be conclusive as to the best definition.

The effect of spherical aberration in the visual appearance of a dark object—say a disc—on a bright ground is that of a disc dark in the centre, and gradually becoming lighter towards its edges, but still maintaining its structure; and the effect round the edge in cases of fairly ample exposure might, as it were, be eaten into by the halation effect produced, so as to cause the definiteness of the outline to soften off, appearing, to a casual observer, out of focus. Now, if this disc be removed nearer to or further from the lens, what happens? In the former case the black disc becomes a *dark ring* with *a definite edge* in the negative, with a lighter centre! In the latter case, a *dark centre* with the halation asserting itself more and more as it approaches the edge! It is evident the *structure* is maintained best at and beyond the best focus.

The appearance of the bright point of light on a dark ground is identical, in the true sense of maintenance of structure, under the same conditions. As before stated, this is the optical test used by astronomers. (I notice Mr. Burton has succeeded in proving this latter test for structure to himself.)

The second reason for the difference between visual and chemical results I have not mentioned before for obvious reasons. It applies to persoual manufacture, and I have not had any encouragement to reply to any previous superficial utterances and letters, except upon premises taken up upon those occasions. Mr. Burton mentions that his experiments were conducted with a lens recently manufactured on the principle of the invention of my late father to produce spherical aberration at will.

Has it never struck Mr. Burton that if the lens were actinic when the back combination was in its normal position, *free from aberration*, that it would not be perfectly so when the back flint was removed from the crown by the process of unscrewing? It not only introduces positive spherical aberration purposely, but also a slight amount of positive chromatic aberration. In the construction as it stands, and for the amount of positive spherical aberration introduced, this alteration will be hardly noticeable, and very difficult to trace, but the tendency is to favour the definition of objects slightly in front of the plane focussed for. For planes behind this, the inward concentration of rays already referred to *continues*, tending to maintain structure, but softening off gradually. The theoretical objection to an under-corrected lens might legitimately have been pointed out by a scientific critic if one had appeared; its practical bearing, however, in the construction referred to, when usually a small amount of positive spherical aberration is introduced, the slight shifting forward of the plane of focus in the object is rather advantageous than otherwise for the desired end to be attained. If excessive aberration be introduced in the construction referred to, the positive chromatic aberration would, of course, assert itself to a noticeable extent.

The final portion of Mr. Burton's letter refers to an entirely different subject, viz., that of the definition given by an aplanatic lens with its powerful discriminating focus, as compared with that of the eye.

Has Mr. Burton ever been down a mine or a deep well in the daytime and seen the stars on looking up? If he has, he will perhaps acknowledge that the less amount of diffused light that reaches the eye, the more discriminating power it has, and also that much more diffused light, under ordinary circumstances, enters the eye in viewing any scene than would enter a well-stopped-down and shaded lens in connection with a camera. To give another example, if a lens has a "flare spot," is the discriminating power of the lens over that portion of the plate the same as in the remainder? As to definition over *one plane*, cited in the last paragraph of Mr. Burton's letter, by inference, excluding the question of diffused light, personally I do see finer definition in the reproduction of a black and white subject in a photographic reduction than I do of the subject itself when viewed under the same angle. I have always understood that the investigations of *authorities* in the subject uphold this view.

## VOLATILE PLATINUM COMPOUNDS.*

BY W. PULLINGER, BRACKENBURY SCHOLAR OF BALLIOL COLLEGE, OXFORD.

The object of this work was to determine, if possible, the vapour density of some compound of platinum. In order to obtain a suitable substance for this purpose, and to find the best conditions under which the trials could be made, some miscellaneous phenomena were observed, worthy of note, but apparently unconnected with the subject.

The only volatile compounds of platinum hitherto known are those described by Schützenberger (*Ann. Chim. Phys.* [4], 21, 350; *Annalen*, Suppl. 8, 242) in the year 1872. They were obtained by passing alternately streams of chlorine and carbon monoxide over platinum sponge heated at 250° in a combustion tube by means of a gas furnace. The volatilised substance was collected in a suitable receiver. In this manner Schützenberger obtained a mixture of three volatile compounds, namely, carbonyl chloroplatinite, $CO,PtCl_2$, dicarbonyl chloroplatinite, $C_2O_2PtCl_2$, and sesquicarbonyl chloroplatinite, $C_3O_3,Pt_2Cl_4$.

Now, if we follow out the instructions given by Schützenberger, substituting a small furnace for the oil-bath in which he heated the tube, we obtain another yellow substance, which remains behind after the volatile compounds have been driven from the heated part of the tube. This compound occupies the same position as the platinum originally did, nor can any amount of heating volatilise it. When hot it is brick-red, and on cooling changes to a bright canary-yellow. It was obtained in two different experiments, but was only homogeneous in the first. From the method of formation, it seemed probable that the product was a combination of platinum, chlorine, and carbon monoxide, since it was not formed till the latter gas had been passed over the platinum chloride for a considerable time. It absorbed water from the air very slowly. An analysis of the substance was made in the following manner. The *water* absorbed from the air was determined by heating the substance in an air-bath to successively rising temperatures till its weight was constant. It proved to be anhydrous at 105°. The *platinum* and *chlorine* were determined by reducing the compound by pure magnesium and acetic acid.

The reduced platinum was collected and weighed. The chlorine was precipitated by silver nitrate in large excess of nitric acid, and the precipitate treated and weighed in the usual manner. The carbon monoxide was found by difference. The percentage composition thus obtained was:—

| | |
|---|---|
| Platinum ... ... ... ... ... | 40·36 |
| Chlorine ... ... ... ... ... | 44·71 |
| Water ... ... ... ... ... | 4·19 |
| Carbon monoxide ... ... ... ... | 10·74 |

Now the water present bears no molecular ratio to the other constituents. Calculating, therefore, the percentage composition of the anhydrous substance, we obtain the values:—

| | | | |
|---|---|---|---|
| Platinum ... ... | 42·12 | against the theoretical | 42·01 |
| Chlorine ... ... | 46·66 | | 45·89 |
| Carbon monoxide ... | 11·32 | | 12·08 |
| | 100·00 | | 100·00 |

which are the values calculated for a compound having the formula $PtCl_2,2COCl_2$, or $PtCl_6,C_2O_2$. The compound would, therefore, appear to be a combination of platinum dichloride with phosgene. It was thought possible that this substance had resulted from the action of a small amount of phosgene on the platinum dichloride. An attempt was, therefore, made to obtain it by passing a stream of phosgene over the heated chloride, but without success.

*Properties of the New Compound.*—It is a yellow, crystalline solid, stable in air, but slightly deliquescent. It dissolves easily in water without blackening, and, on evaporation, separates from its solution in yellow crystals apparently unaltered. In alcohol it is only slightly soluble, and carbon tetrachloride dissolves scarcely any. When strongly heated, it is decomposed with evolution of chlorine and phosgene. Thus, it has none of the properties characteristic of Schützenberger's compounds. It may perhaps be called phosgeneplatinum dichloride.

Specimens of carbonyl chloroplatinite, $CO,PtCl$ , and dicarbonyl chloroplatinite, $C_2O_2Pt_2Cl_4$, were next prepared in the pure state. The former was obtained by bubbling carbon monoxide for over an hour through the melted crude product; the latter, by a similar method, substituting carbon dioxide for the monoxide.

Schützenberger says that the action of water on these compounds is very complex (*loc. cit.*). This, perhaps, results from a secondary action which takes place between the hydrogen chloride and the undecomposed substance. The equations given for the action of water are:—

(1.) $CO,PtCl_2 + OH_2 = CO_2 + Pt + 2HCl$,

(2.) $C_2O_2PtCl_2 + OH_2 = CO_2 + CO + Pt + 2HCl$;

but, as Schützenberger points out, these represent only

* *Journal of the Chemical Society.*

the chief actions. Now, in neither of these reactions is platinum formed as a first result of the action. If a drop of water is added to a crystal of the substance, it immediately becomes black. But both strong hydrochloric and strong nitric acid dissolve the black substance; therefore, it cannot be either platinum or platinum dichloride, for the former is soluble in neither acid, and the latter is insoluble in nitric acid. Hence, if hydrogen chloride be formed by the action of water, it will tend to keep part of the substance in solution. Schützenberger found that a very considerable quantity of platinum remained in solution; but, in presence of a large excess of water, platinum is eventually precipitated.

*The Action of Various Gases.*—In order to find a suitable atmosphere into which to volatilise the substances for the vapour-density experiments, the action of various gases was tried. The results are, briefly, as follows:—

*Action of Dry Air on* $PtCl_2,2CO$.—The substance is unchanged till its melting point is reached, when carbon monoxide is evolved; the residue then solidifies, melting again at 190°. A little above this temperature it decomposes with a slight sublimation.

*Dry hydrogen* has no action in the cold. At the melting point the compound is at once reduced to metal with partial sublimation. If the hydrogen be burned the flame becomes luminous, and deposits a film of platinum on the surface of porcelain introduced into the flame.

*Dry chlorine* has no action till from 80° to 90°, at which temperature the compound fuses, losing carbon monoxide with effervescence. At 115° it solidifies; at 140° it fuses again, and is decomposed.

*Dry Carbon Dioxide.*—Schützenberger says the substances can be distilled in this gas; but it is very difficult to volatilise them completely. A large residue of platinum dichloride is invariably left.

*Phosgene* had a peculiar action in the cold. Yellow drops of liquid were formed where the substance was in contact with the glass. This liquid could not be obtained in sufficient quantity for examination. A considerable quantity of the substance volatilised when the tube was heated, but complete vaporisation seemed impossible. It is also noteworthy that the compounds heated at 100° with liquid carbonyl chloride in a sealed tube are dissolved by it, and deposited again on cooling in large crystals. In a vacuum the substance was also incompletely volatile. The only gas in which it seemed possible to determine the vapour density was carbon monoxide.

*(To be continued.)*

Harvard's New Telescope.—A Boston firm is constructing a photographic telescope for Harvard University which will probably be the largest and finest instrument of the kind ever designed. The lens is to be like that used by photographers rather than that of an astronomical telescope, and will consist of two achromatic lenses. Its aperture will be twenty-four inches, and its focal length eleven feet. A telescope of this form, but of one-third its size, is now in use at Harvard.—*Detroit Free Press.*

As the days grow shorter we have many reminders that the lantern season is getting near, but in case we should forget the important fact, Messrs. G. W. Wilson and Co. forward us their new catalogue, in which many novelties are apparent. They specially direct attention to the circumstance that all their slides are made from direct negatives, that those negatives are of the best quality only, and that every slide is individually tested before it is placed on the market. Besides this list, Messrs. Wilson's general catalogue of 12,000 views is available to the lanternist, for he can procure any view in the form of a slide.

## ART IN PHOTOGRAPHY.*

BY A. L. BOWERSOX.

The first question agitating the photographer's mind is, "Is there art in photography?" and "To what extent has it been cultivated?" The devotee of the palette, brush, and paint politely informs you that there is no art in photography, and that photographs are only machine-made, and that they are not, strictly speaking, art productions. We admit that our art is not a creative art in the sense an artist uses the term; that is, we cannot make a picture from nothing; we must have our subject and our accessories to work with in order to make our productions. Shall we not, then, take up some of the rudiments of art and then compare notes, and thereby ascertain whether or not we have any claim on so high and noble a profession? And first, let us study composition. The master will inform you that composition is the art of arranging figures or objects so as to adapt them to any particular subject. In composition three requisites are necessary: that the story be well told; that it possess a good, general form; that it be so arranged as to be capable of receiving a proper effect of light and shade.

The form of a composition is best suggested by the subject or design, as the fitness of the adaptation ought to emanate from the circumstances themselves, hence the variety of composition. We must admit that in composition we are (to some extent) at the mercy of the lens we employ. The artist probably decides to paint a group, and in his mind he has formed a circle; but would not think of representing that group in a real circle. No; he steps back, in his imagination, a few paces, or rods possibly, according to the size of the group, and that circle no longer remains a circle, but an oblong! Does not the photographer see that circle the same, and with the same artistic eye? If he has given his subject any thought or study, he will most assuredly. Does not the photographer have a point of sight in his productions? Does he not aim to have a pleasing effect? These, and many other points that go to make up a good photograph, must be well understood by both artist and photographer in order to bring them in good requisition. In case of a bust picture the operator must decide upon the position, whether to elevate his camera or have it level; whether to take a front view or side view; whether to bring his subject under the light with contrast, or more evenly. All these points are requisites to a good picture.

The next point in study in art is chiaroscuro. Again we are told that harmony, which is produced by chiaroscuro, or by the means of black-and-white, depend upon the quantities of light and dark employed and the disposition of them; sometimes meeting in extremes of opposition, in other portraits gliding away with imperceptible softness into undefined spaces; the light sometimes falling on combined objects, giving out a faint halo around the group; you may have observed this in photographing light objects on a dark ground. Not every lens will show this; some will.

The power of producing a variety of pleasing sensations upon the eye mainly rests on the conduct of the chiaroscuro; objects are rendered either strong or delicate, according as they advance or retire on the perspective plane of the picture. Parts are forced upon the spectator's attention by their clear, defined character, and assisted from contrast by groups of indistinct images imbued with the properties of middle tint.

* Read at the Photographers' Association of Ohio.

I was quite surprised, at our last two conventions, by some of the criticisms offered on the pictures upon the screen; the criticisms were on the pictures having more than one point of light. It is a fact that a bust portrait should only have but one light, but in half length of figures it is not contrary to art to have more than one point of light. And so we could go on to enumerate instances where art and photography, or art and art in photography, come to a perfect agreement.

Our photographers who make a study of *genre* photography must study invention, which is claimed to be the great soul of painting. The subject he desires to illustrate must be created within the mind, and with his hands he must arrange every detail, from the most important to the minutest, thereby proving that art in photography and art go hand-in-hand.

The operator has no choice in subject, but must do his best with each subject presented. His choice must be in the point of view, in the light and shade, and the general use of background and accessories. One essential in every really good photograph is a point of vision—one that will please the eye and not tire it after carefully observing it in all its phases. In case of a front view the eyes form the point of view, with all the rest subservient and gradually fading out of view. By observing a few of these rules we obtain what the artist calls "drawing," which we must acknowledge a great many photographers lack, and when we touch the point it brings us to one of the essentials, and that is the background. There is more thought and study required in that accessory than in any other. Writers in our photographic journals have been advocating reform in backgrounds, and advising to keep them back—not bring them too near the subject.

In case of a bust picture, I think, if your ground is the right kind, you can bring it well up, and thereby secure better effects than by keeping the ground five or ten feet away. If your ground is too plain, take a little common chalk and a tuft of cotton, and in a few minutes you can have the relief you aim at by a few well-directed strokes. Art seems to be made up of small bits, and if we are able to carry them in our mind, and then put them together correctly, we shall be able to behold art in photography.

## PHOTOGRAPHIC CHEMISTRY.*

BY PROFESSOR R. MELDOLA, F.R.S.

Continuing the study of those properties of silver salts which are of photographic importance, the next point to be dealt with is the vexed question of the existence of sub-salts. Here, in the present state of knowledge, it is most advisable to avoid dogmatic statements. The utmost that can be done is to summarise the evidence, and to let the student see therefrom that, from a scientific point of view, the existence of such sub-salts has not been conclusively demonstrated. I will only repeat now what I said some years ago, namely, that so far as analogy is to be trusted as a guide, it would seem improbable that the sub-haloid salts of silver should be highly coloured compounds, because the analogous salts of copper, mercury, and thallium are not highly coloured. Now, all the attempts which have been made to produce sub-haloid salts of silver by partial reduction or by other methods give rise to coloured products, which have been held by some investigators to consist of the sub-haloids, and by others (Carey Lea) to consist of molecular compounds of the sub-haloids with the haloids proper. It may further be suggested that these coloured compounds might consist of oxyhaloids, mixed or combined (molecularly) with the haloids, that in some cases they might consist of metallic silver or its oxide in molecular combination with the haloid, and that in other cases they might consist of the foregoing compounds or mixtures, or of the true haloids coloured by the retention of a small quantity of some metallic oxide as an impurity.

* Continued from page 639.

The study of these coloured products is of importance to the photographic chemist, whether they are definite chemical compounds, or whether they are molecular compounds, or whatever subsequent research may prove them to be. They are of importance to us here, among other reasons, because there may be some relationship between these compounds and the products formed by the photo-chemical decomposition of the silver haloids. I have thought it desirable, therefore, to summarise, in a collected form, the various methods by which these compounds have been produced :—

1. Rose-coloured silver chloride, obtained by reducing a hot solution of silver citrate with hydrogen, exhausting the dark product (before complete reduction) with citric acid, and then treating it with hydrochloric acid. Obtained also by reducing the dry nitrate in hydrogen at 100° C., extracting the product with water, and treating the residue with hydrochloric and nitric acids. (Brit. Assoc. Rep., 1859, p. 105.)

2. Chocolate-coloured chloride ; obtained by adding a solution of silver arsenite in nitric acid to a strong boiling solution of caustic soda, when "an extremely black powder" is produced. This, on treatment with hydrochloric acid, becomes grey, and the washed product, on boiling with dilute nitric acid, loses silver and leaves the chocolate-coloured chloride. (Brit. Assoc. Rep., 1859, p. 106.)

3. Coloured products obtained by acting upon silver with solutions of ferric or cupric chloride have long been known.

4. Coloured products obtained by Carey Lea, and described as "photochloride," "photobromide," and "photoiodide" ("photosalts").

(*a*) Purple or black chloride, obtained by the action of alkaline hypochlorites on finely-divided (reduced) silver.

(*b*) Red chloride, prepared by adding ferrous sulphate to an ammoniacal solution of silver chloride, and then acidifying with dilute sulphuric acid. The precipitate is washed, boiled with dilute nitric acid, washed, and finally boiled with dilute hydrochloric acid.

(*c*) Red or copper-coloured chloride, prepared by heating silver oxide or carbonate to a point short of complete reduction, and then treating the residue with hydrochloric acid.

(*d*) By precipitating silver oxide in the presence of the lower oxides of iron, manganese, &c., and treating the product with hydrochloric acid.

(*e*) Dark purple chloride, obtained by treating finely divided (reduced) silver with a solution of ferric chloride. (Contains 76·07 per cent. of silver.)

(*f*) Red chloride, similarly prepared by the action of cupric chloride.

(*g*) Red chloride, prepared by pouring dilute solution of silver nitrate on to cuprous chloride, and boiling the black precipitate thus obtained with dilute nitric acid.

(*h*) Brownish purple chloride, prepared by pouring an ammoniacal solution of silver nitrate into a strong solution of ferrous chloride, and treating the dark precipitate with dilute sulphuric acid. Becomes lighter with nitric acid. (Similar to *b*.)

(*i*) Purple chloride, prepared by reducing the citrate in a current of hydrogen at 100° C., and treating the product with hydrochloric and nitric acids successively. (Similar to No. 1.)

(*j*) Red and purple shades of chloride, obtained by reducing (partially) a silver salt with alkali and an organic reducing agent, such as milk-sugar, dextrine, &c., and then treating with hydrochloric and nitric acids successively.

(*k*) Red, brown, or lavender chloride, produced by treating the white chloride with a boiling solution of sodium hypophosphite. The dark, chocolate-coloured product is washed, and boiled with dilute nitric acid.

By somewhat similar methods, coloured forms of the bromide and iodide have been obtained.

From these special studies of the silver compounds we may now pass to another phase of the subject, viz., the combination of silver and its salts with organic compounds. At this stage the technology—*i.e.*, the sources and methods of manufacture of the more important organic compounds used by the photographer—may be conveniently introduced. The ordiuary organic acids, such as acetic, oxalic, citric, tartaric, &c., will of course have been dealt with in the preliminiary traiuing, but in addition to these, special attention should be directed to the chemistry and technology of cellulose (including paper, collodion, and celluloid), albuuen, and gelatine. Let it be realised iu the course of this work that albumen is of the nature of an acid formiug salts with various metals. Show the precipitation caused by such salts as those of mercury and silver. Let the precipitated "albuminate" of silver be collected, washed, and dried, and theu the presence of silver proved by burniug some of the compound, extracting with dilute nitric acid, filtering, and testing in the usual way. The similar tendeucy of gelatine to combine with silver compounds is very striking, aud of fundameutal importance to the photographic technologist. The best way of approaching this is to let the student make experiments for himself. A sheet of gelatiue can be prepared by coatiug a glass plate with a warm, strong solution of the substance, and allowing it to dry for some days in a warm place. When stripped off, the film is floated for some hours on a solution of silver nitrate, theu removed and washed with water. It now remains to be shown that silver in some form or other has actually been withdrawn from the solution, and has eutered into combination with the gelatine. In order to prove this, some of the gelatine compound can be dried, and burnt, and tested in the same way as the "albuminate." The "gelatino-nitrate" can also be proved to darken on exposure to light. An experiment of this kind will prepare the way for the all-important subject of the preparation of emulsions.

The first point to which attentiou must be called is the nature of an emulsion, and the influence of the vehicle iu keeping the silver haloids in suspension. An easy experiment will bring this home to the student. To a solution of common salt or some soluble bromide add some silver uitrate, aud notice the immediate separation of the silver haloid on agitation. Now take some of the same salt solutiou, add a little strong gelatine solution to it, mix by agitatiou, and then again add some of the same silver nitrate solution. It will be noticed that the separatiou of the silver haloid takes place more slowly, and that when formed it does not subside as in the previous experiment, but agitation simply helps to make the contents of the vessel (now an emulsiou) more uniform. A similar experiment may be made with ordinary alcohol and ether containing a soluble haloid ($ZnBr_2$, or $CdBr_2$), and then, by way of comparison, with the same alcohol and ether containing dissolved pyroxylin (collodion).

The broad distinctiou between purely physical changes induced by light and actual photo-chemical decomposition may be maintaiued, although it is ofteu difficult to refer a particular case to one or the other of these classes. The simplest kind of photo-physical action is that which produces a chauge in molecular structure, either temporary or permaueut. In connection with this, the action of light upon seleuium is perhaps the most striking illustration that can be giveu, aud, where the necessary apparatus is at hand, it would be well to demonstrate the point experimentally in the usual way. As examples of permaueut change of molecular structure, the modifications in crystalline form undergone by certain substances on exposure to light may be appealed to aud illustrated. The followiug experiments cau be easily done in the laboratory :—

1. A saturated solution of sulphur in carbon disulphide is prepared, and two or three tubes are filled with the solution and sealed up. The coutents of a tube kept in the dark will remain clear for an indefinite time, but on exposing one of the tubes to suulight the contents become turbid, and a gradual separation of insoluble sulphur crystals will take place.

2. A plate of glass is coated with a silver mirror by any of the usual methods of chemical reduction. The mirror is iodised by exposure to the vapour of iodine, and then exposed to bright light (electric arc or sunlight) for ten or fifteen minutes, one portion of the film being protected by a dark paper screen. The film is semi-transparent at first, but after the experiment it will be found that the exposed portiou has become yellower and more opaque than the screened portion, the change being apparently due to a physical modification of the silver iodide.

Attentiou may be called to the existence of other changes of a like nature, such as those which occur in red cinnabar, in red realgar, in the crystalline form of nickel sulphate and zinc selenate, &c. From cases of this kiud we are led, in the next place, to other changes, which serve to connect photo-physical with photo-chemical action, viz., photo-polymerisation. The meaning of the term polymerisation will be familiar to the chemical student. It must be poiuted out that many of the changes iu crystallive form, &c., alluded to in connection with the previous examples, may be really cases of photo-polymerisatiou or depolymerisation. Then the known cases of the polymerisation of organic compouuds, such as anthraceue to paranthracene, styrene to metastyrene, vinyl bromide, thymoquinone to an insoluble modification, aud so forth, may be dealt with aud illustrated, as far as possible, experimentally. Pointing out, by way of caution, that it is often very difficult to discriminate between photo-polymerisation and photo-oxidation, the action of light upon asphalt and bituminous substances may be taken as an illustration of the difficulty iu questiou ; and a study of the actiou of light upon such films will naturally lead to the various heliographic processes based upon the original method of the elder Niepce.

The action of light upon asphalt and similar substances is not only of practical importance, but its scientific aspect is worthy of the most serious atteution, both by the student aud the investigator, who, after all, is himself ouly a studeut at a somewhat more advanced stage of his studies. There is some doubt at present whether the insoluble asphalt resulting from the actiou of light is a polymeride, or whether it is a product of photo-chemical oxidation. According to some authorities, the change does uot take place in a vacuum, neither in nitrogen nor in hydrogeu. On the other hand, it is stated by Kayser, in favour of the polymerisation theory, that no increase of weight occurs in the film, that the insoluble asphalt is converted into the soluble form agaiu by fusion, and that a solution of asphalt iu a closed vessel also deposits the iusoluble modification ou exposure to light. The decisiou of this point rests with future investigators, but certain facts have been discovered with respect to the constitueuts of asphalt which must be emphasised in connection with photographic chemistry. It has been found that Syrian and Trinidad asphalt contain a small quantity (4 to 5 per ceut.) of a substance soluble in alcohol and insensitive to light, another portion (44 to 57 per cent.) soluble in ether, and a residue insoluble in ether, varying from 52 to 38 per ceut. The portions soluble in alcohol and ether, and the insoluble residue all contain carbon, hydrogeu, and sulphur ; and Kayser, who has iuvestigated these compounds, has goue so far as to assign formulæ to them. The portion which is soluble in ether is sensitive to light, but not so sensitive as the insoluble residue, which contains the constituent of the greatest value for the heliographic processes. The practical outcome of these investigations has been the preparation of a high quality asphalt, cousisting essentially of the portion insoluble in alcohol aud ether. It may be added that the property of becomiug insoluble in hydrocarbon oils on exposure to light does not appear to depeud upon the coustituent contaiuing the sulphur, as some specimens of asphalt from different parts of the world, which possess the same property, have been found on analysis to be free from sulphur, and to consist of hydrocarbons only.

From these cases of photo-physical action, of polymerisation, and of possible photo-chemical oxidation, the study of true photo-chemical decomposition may be taken up. On account of the comparative simplicity of their decomposition, the salts of iron leud themselves admirably for demonstration at this stage. The study of the ordinary chemical reactions of irou salts will have prepared the way. Having shown how reducing agents couvert ferric iuto ferrous salts, let it be demonstrated experimeutally that many orgauic compounds, such as alcohol, oxalic acid, &c., do not immediately reduce ferric salts. It must then be pointed out that these organic compounds are susceptible of oxidation by ferric salts under the influence of light—that they are, in fact, potential reducing agents. This can be done in test-tubes or flasks in the first place, and then on paper films, leading to the ordinary cyanotype and blue printing processes. A few hints for the carrying out of the experiments may be found servicable :—

1. A solution of ferric chloride (2·3 p.c.), mixed with a solution of oxalic* acid will, of course, on testing with potassium ferricyanide, give no blue colouration. Some of the same solution, exposed for five minutes or so to strong light, will be found to contain ferrous salt on again testing with ferricyanide :—

$$2FeCl_3 + H_2C_2O_4 = 2FeCl_2 + 2HCl + 2CO_2.$$

2. By using ferricyanide with the ferric salt, and exposing to light, the reduction is made visible by the formation of Turnbull's blue. This can be done by adding ferricyanide to the foregoing, or preparing two solutions : one containing 8 grammes of potassium ferricyanide in 50 c.c. of water, and the other containing 10 grammes of ammonio-ferric citrate in 50 c.c. of water. The solutions are mixed before use, and then exposed to light, first in a test-tube, and then on paper coated with the solution, and allowed to dry in the dark. The practical application of this method for copying and printing will be obvious.

The chief point of general theoretical importance brought out by such experiments as these is, that light only reduces the ferric salts in the presence of oxidisable compounds of sufficient instability. It is advisable, at this stage, to introduce the notion of *sensitisers*, and to point out that oxalic acid, citric acid, alcohol, &c., may be regarded in this light in the experiments referred to. The demonstrations with ferric salts may, of course, be extended in many directions, and made the basis of numerous practical exercises and lessons in the application of general chemical principles to special cases. All that has to be borne in mind is, that a surface of an organic salt exposed to light under a stencilled design (or a picture) gives ferrous salt on the exposed portions, leaving the unexposed portions unchanged. Various reagents may then be used to reveal the chemical difference in the two portions, the subject of photographic development being thus introduced, and the changes evolved being explained by ordinary chemistry. By way of example :—

A design printed on paper coated with ammonio-ferric citrate is developed by ferricyanide. The exposed (reduced) portions come out blue, owing to the formation of Turnbull's blue. Supposing ferrous citrate to be formed :—

$$Fe''_3 (C_6H_5O_7)_2 + K_6Fe_2Cy_{12} = Fe_3 (Fe_2Cy_{12}) + 2K_3 (C_6H_5O_7).$$

The blue design, after being well washed, can be made the subject of many further experiments, all instructive as illustrating chemical principles with which the student should be familiar. Thus, on treatment with a dilute solution of caustic soda, the blue is at once decomposed, with the formation of $Fe_3O_4$, which remains on the paper. We have thus a faintly visible brownish design, which can again be developed by taking advantage of the property possessed by the oxides of iron of forming coloured compounds with organic substances, such as gallic acid, alizarin, nitro-sopheuols, &c.

It may be pointed out that the photo-chemical reduction of ferric salts, although practically useful for printing purposes, takes place too slowly to enable these compounds to be used at present for the production of camera pictures. But there is no reason why the rate of photo-chemical reduction—*i.e.*, the sensitiveness of these compounds—should not be increased by admixture with some easily oxidisable substance, and a sensitive film prepared by this means, which would cheapen photographic processes by dispensing with the use of silver salts.

In the same way that the photo-chemistry of iron is studied, the other sensitive metallic compounds may be dealt with. The reduction of uranic salts, and the development of uranium prints by various reagents, will naturally be connected with the analogous ferric salts. The photo-chemical reduction of chromates in the presence of organic substances, such as gum, albumen, and gelatine, will lead to the numerous practical applications of chromated gelatine in the processes of etching, pigment printing, collotype, &c. In these processes practical instruction may be given at this stage as far as thought desirable. The salts of mercury and copper may also be studied with advantage, as illustrating the nature of photo-chemical decomposition. The well-known greenish mercurous iodide is easily prepared by decomposing freshly-precipitated and washed mercurous chloride with a solution of potassium iodide. Some of this salt, washed by decantation, and exposed under water to the action of strong light, rapidly darkens, owing to the liberation of metallic mercury.

The action of light on the salts of copper forms a convenient introduction to the photo-chemistry of the silver salts. Thus, cuprous chloride darkens, on exposure to light, with as great a rapidity as silver chloride.

When discussing photo-chemical decomposition, it should be pointed out that indirect results are often obtained by using a mixture of substances of which one of the constituents is not directly affected by light, but is altered by contact with the product resulting from the photo-chemical decomposition of the other constituent of the mixture. For example, paper coated with ferric chloride, and exposed to the light, gives a surface of ferrous chloride by photo-chemical reduction, the size or cellulose of the paper acting as the sensitiser (chlorine absorbent). But if the surface is coated with a mixture of ferric chloride and cupric chloride, the ferrous chloride which is formed reduces the cupric salt with which it is in contact :—

$$2FeCl_2 + 2CuCl_2 = Cu_2Cl_2 + 2FeCl_3.$$

The picture is thus formed in cuprous chloride instead of in ferrous chloride, and, by treatment with potassium thiocyanate, cuprous thiocyanate is formed, which, on subsequent treatment with potassium ferricyanide, leads to the development of a brown print. This method of utilising a mixture of ferric and cupric salts is the basis of Obernetter's process.

There can be no doubt that this principle of indirect decomposition is destined to play a very important part in the photography of the future. It has already come into prominence in the well-known platinotype process of Willis, in which a surface is coated with a mixture of ferric oxalate and potassium chloroplatinite. On exposure to light ferrous oxalate is formed, while the chloroplatinite is not directly reduced. On treatment with a hot solution of potassium oxalate the ferrous oxalate is dissolved out, and at the moment of solution reduces the chloroplatinite to finely divided platinum *in situ*. In the direct printing platinotype process we have a surface of potassium chloroplatinite, sodium oxalate, and sodio-ferric oxalate. In this case the reduction of the ferric salt by light is accompanied by the indirect reduction of the chloroplatinite by means of the ferrous salt thus formed. In the cold platinotype of Willis the operations are separated, the ferric surface being first exposed in the usual way, and then development being effected by immersion in a cold solution of potassium chloroplatinite containing potassium oxalate and phosphate.

*(To be continued.)*

* The addition of some alcohol increases the sensitiveness of the mixture.

---

Photographic Club.—Subject for Sept. 23rd, "Enlarging"; Sept. 30th, "Mounting and Finishing." Outing Saturday next (19th) Perivale ; train from Paddington to Castle Hill at 2.35 p.m. The last outing of the season (Hampstead) has been postponed to Saturday, October 3rd.

M. Dagreve, in *Les AnnalsPhotographiques*, suggests the following method of silvering old plated or copper articles, which may be useful to any chemist who has some old fixing baths and some worn electro-plate. The articles to be plated are well washed in soap and water, and then immersed in an old fixing bath which has been used for fixing plates. In a very short time a deposit of silver forms, and then the article should be taken out, rinsed, polished with soft leather, and again immersed till the deposited silver is thick enough. When an extra thick coating is desired, a piece of wire is affixed to the object, and at the other end of the wire a sheet of zinc, allowing one square centimetre of zinc to every square decimetre of the article to be plated. It is not advisable to use old print fixing baths for this purpose, as the silver has a peculiar yellow tinge ; but chloride of silver which has not been exposed to light may be used.

## Patent Intelligence.

### Applications for Letters Patent.

15,181. Rose Mary Shawcross, 15, Water Street, Liverpool, "Improvements in or Connected with Sensitised Surfaced Paper, Woven or Tissue Fabrics, or other Material for the Production of Copies of Drawings, Designs, Pictures, Photographs, Writings, and the like, by the Action of Light."—*September 8th.*

15,282. Edgar Clifton, 108, Regent Street, London, "Improvements in Apparatus for Producing Enlarged Copies of Photographs."—*September 9th.*

15,334. Charles Ruby Neve, 37, Chancery Lane, London, "Improvements in Photographic Cameras."—*September 9th.*

15,434. Julius Hauff, 166, Fleet Street, London, "The Preparation and Employment of Aromatic Amido-Compounds as Developing Means in Photography."—*September 11th.*

### Specifications Published.

5,742. *April 16th,* 1890.—"Developing Apparatus." E. Fairweather, 218, Devonshire Road, Forest Hill, Kent.

Developing is performed in a vessel provided with a non-actinic transparent top and bottom, so that the development can be performed and its progress observed in white light. The top and bottom may be also fitted with opaque covers. The solutions are admitted through covered funnels, and are discharged through a pipe. The apparatus is rocked by a pendulum.

## Correspondence.

### THE "ACME" CAMERA—A WARNING.

Sir,—We have to-day had sent to us by a gentleman a camera which he had bought as one of our patent "Acmes," but from which the name-plate had been lost, asking us to put in a new tablet; but, although the camera is an exact copy of ours in every respect, it is not of our make, and is of decidedly inferior workmanship to what we supply. We therefore wish to warn the public against purchasing such cameras, and to state that we shall be pleased to verify for anybody a camera that they may have bought described as of our manufacture, while we shall be much obliged for any information which may help us to discover who is making these cameras, so that we may take such measures as the law allows to protect both ourselves and the public.

Perhaps you will be good enough to publish this letter in your journal. W. Watson and Sons.

313, *High Holborn, London, W.C., Sept. 15th.*

## Proceedings of Societies.

### Holborn Camera Club.

*September 11th.*—Mr. T. O. Dear in the chair.

Mr. John Howson gave a lecture on the "Ilford Printing-out Paper" (gelatino-chloride). After dilating on the commercial questions connected with the paper, Mr. Howson said two toning baths were recommended; the first consisted of—

| | | |
|---|---|---|
| Water ... ... ... ... | ... 16 | ounces |
| Sulphocyanide of ammonium ... | ... 75 | grains |
| Chloride of gold... ... ... | ... 2½ | ,, |

The second, a combined toning and fixing bath, was as follows:—

| | | |
|---|---|---|
| Water ... ... ... ... | ... 20 | ounces |
| Hypo ... ... ... ... | ... 5 | ,, |
| Citric acid ... ... ... | ... 60 | grains |
| Acetate of lead ... ... ... | ... 60 | ,, |
| Sulphocyanide of ammonium ... | ...240 | ,, |
| Chloride of gold ... ... | ... 3 | ,, |

The mode of working and final operations were similar to those of the gelatino-chloride papers now on the market. With regard to the use of an alum bath, he thought the special nature of the gelatine used rendered it, in most cases, unnecessary. Mr. Howson then toned some prints on the new paper, which, together with a number of finished prints, showed its advantages.

On Saturday fourteen members and friends attended the Keston outing.

### National Association of Professional Photographers.

A meeting of the Council was held on the 8th inst. in the Pillar Room, Anderton's Hotel, Fleet Street, London. The following members were present:—Messrs. H. J. Whitlock (President), John E. Shaw and Robert Slingsby (Vice-Presidents), Barry, Fall, Elliott, Warwick, Brookes, MacIver, Eddison, Roxby (Treasurer), and C. P. Richards (Hon. Secretary).

Mr. Whitlock alluded to the growth of the Association, and the absolute necessity of engaging the services of a paid secretary, at the same time paying a high compliment to the hon. secretary for his able services. A sub-committee was appointed with power to interview and engage a gentleman for the position.

A discussion took place upon the important question of trade price lists, and a course of action was agreed upon.

Reports from the various branches were received of a very encouraging character, and the Council generally expressed every confidence in the great future of the Association, and its power to remedy many anomalies now existing.

### North Middlesex Photographic Society.

*September 14th.*—Mr. J. Stewart in the chair.

Mr. J. Howson demonstrated the working of "Alpha" paper, and passed round a number of prints. In his preliminary remarks, Mr. Howson pointed out that an amateur frequently had little time for daylight printing. This process would enable him to obtain warm tones when they would otherwise be impracticable. The points to be observed were to follow the instructions closely, and to expose always for the same time at the same distance from a uniform light when uniform results were desired. Six inches from a batswing burner was the distance recommended for a small negative. A greater distance would be necessary with a large negative to equalise the light. From two to three minutes would be necessary for a moderately dense negative. To obtain brilliant prints from a weak, flat negative, develop deeply with half old and half new developer, and allow to remain in the clearing bath till the high-lights were sufficiently reduced. The red tones obtained by prolonged exposure would be retained after fixation, even if the prints were not toned, but slight toning was generally desirable even for the warmest tones. It should be borne in mind that if the tones obtained were too warm, the prints could be toned to colder shade, even after they had been dried and stored for any length of time. Mr. Howson then developed and toned a number of prints showing the range of colours obtainable from equal exposures and development.

Many questions were asked and satisfactorily answered. Cloud printing by combination was doubtless difficult by reason of the difficulty of differentiating the exposure to the two negatives to obtain identical tones.

A Member was of opinion that this would be overcome by making trial exposures.

The usual competition of prints of views at the Society's field-days was held. Mr. Marchant received the vote of merit for Roydon, Mr. Gregory for Loughton, Mr. Staveley for Edgware, and the Secretary for Kew.

An ingeniously made shutter sold by Messrs. Perken, Son, and Rayment was shown, and prints on mat-surface paper by Obernetter. A very rough-surface paper by the Blackfriars Sensitising Co. was much liked. Mr. H. Smith reported that he had found Mr. Barry's printing meter invaluable in printing-in clouds in platinotype. Mr. Taylor showed prints from the negatives he made when demonstrating development at the last meeting, making clear the points he had dwelt upon in his address. Two reversed negatives (snap shots with a medium stop) were shown by a member. As the conditions under which they were taken precluded the possibility of supplementary exposure, and as the edges of the plates were plainly oxidised—as another brand of plates exposed and developed at the same time and under the same conditions were satisfactory—the unanimous verdict was "stale plates." As the brand of plates complained of enjoys an excellent reputation, the dealers (a large establishment) from whom they were purchased are apparently to blame for faulty storage.

One new member was elected and three nominated.

The next meeting was announced for the 28th inst. The subject will be "Photo-mechanical Printing."

### South London Photographic Society.

*September 7th.*—Mr. Mark Boxall in the chair.

Mr. Crouch showed his hand-camera, and gave much valuable information as to the best way in which to use a hand-camera to ensure the picture being in the centre of plate, even though it was not fitted with a finder. Mr. Crouch also gave a lecturette on the "Use of Lenses," in the course of which he gave a formula for re-blacking diaphragms that had become bright by wear.

The Secretary announced that he had been unable to obtain permission for the Society to take photographs at Lambeth Palace.

### Hackney Photographic Society.

A meeting was held last Thursday, Mr. Arthur Dean presiding. Work was shown by several members.

The Hon. Secretary gave an illustrated lantern lecture on "A Holiday in the Isle of Man and Ireland with a Hand-Camera." Several of the views shown were very fair, and illustrated very well the powers of a hand-camera.

Mr. Dean showed numerous views of Ireland, and Mr. Day gave a very interesting account of the geological formation of the rocks at the Giant's Causeway.

Captain Abney has kindly consented to distribute the prizes at our Exhibition and competition on Thursday, October 22nd, 1891.

### Putney Photographic Society.

*September 10th.*—Rev. L. Macdona in the chair, to consider sundry alterations in the Society's policy and rules.

A motion that the word "amateur" be struck out of the Society's name was unanimously carried.

For the future, the Society's year will end in April and begin in May, in which month the election will take place. The financial year is to remain as at present, January to December. The members of the council having tendered their resignations, elections to fill the vacancies will be at once proceeded with.

Winter session begins October 14th, on which date the subject will be "Illustrated Journalism," by Mr. T. C. Hepworth.

### Brechin Photographic Association.

The annual general meeting was held on the 9th inst., the president, Mr. Wm. Shaw Adamson, Jun., in the chair. Six new ordinary members were admitted, viz., Rev. T. L. Ritchie, Messrs. G. T. Robertson, B.Sc., A.M.I.C.E., G. M. Scott, J. Buchanan, Innes, and Smith. The usual reports of the secretary, treasurer, and curator were read and adopted, and these officials were thanked for their services. The report of the sub-committee appointed to revise the rules was adopted, and the new rules agreed to. The night of meeting has been altered to the third Wednesday of the month.

The office-bearers for the coming year were elected as follows:—*President*—Mr. Wm. Shaw Adamson, Jun.; *Vice-Presidents*—Messrs. G. Mackie, A.Ph.S., and H. Braid; *Secretary*—Mr. James D. Ross, 6, High Street, Brechin, N.B.; *Treasurer*—Mr. Innes; *Curator*—Mr. J. C. Middleton; *Committee*—Messrs. Ferguson, Buchanan, and Dakers.

International Exhibition at Brussels.—Mr. Henry Flather calls our attention to the circumstance that, in publishing a list of awards to English exhibitors in our issue of the 24th of July, we omitted his name. Mr. Flather is to receive a bronze medal for his series of "Dry Point" enlargements.

## Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

Photargus.—*Copying and Children's Portraits.* 1. The enlargement from carte-de-visite to cabinet is about as good as you can expect; the scheme resorted to of draping the front of the camera with a white cloth is a distinct improvement not usually adopted. The Spanish dame's black costume would, perhaps, have borne a little more exposure, but the print not having been toned, does not allow of our seeing the enlargement at its best. 2. The taking of children's portraits is beset with difficulties, and even with the means at your command must often entail the wasting of a few plates. A windmill toy, musical box, or something to attract attention for a moment sometimes helps, and the back rest, with spring grip to catch the clothes, is an aid in preventing the little folks from swaying the body. A very pretty pose for youngsters who can sit up, is to put their legs through the back of a Chippendale chair, the low rail of which serves to engage their hands and keep them steady.

R. C. B. (Gateshead).—The negatives have come safely to hand, and we are now anxious to see the enlargements. Our amateur friend is still in America.

M. Bros.—*Photo-Lithography.* As a first step, you should get Mr. W. T. Wilkinson's book on "Photo-Lithography, Collotype, &c." (London: Hampton, Judd, and Co.) Study this, and, if you think proper, put yourselves in communication with the author, whose address is Henry Street, Derby.

J. A. B.—The lens named is a thoroughly reliable instrument for out-door work. We have recently heard a very good report of it from a correspondent, upon whose judgment we can rely, and he was using it with a hand-camera.

I. C. U. (Wymondham).—*Opalines.* Quite recently Mr. Edward Dunmore described in the News the method of producing these. They are simply prints mounted in optical contact, with gelatine, on specially-prepared bevelled glasses. All the requisites can be had of the dealers. Probably Messrs. Marion and Co. would give you the desired estimate; or the Autotype Company, if you wish them reproduced in carbon.

L. A. S.—*The Dangers of Ammonia.* Thanks for sending us the newspaper cutting. Fatal accidents are rare, and the unfortunate occurrence was probably attributable to the heat accompanying the recent spell of fine weather. A Winchester quart bottle of ·880 ammonia always requires careful handling in summer time, and it is advisable to cover it with a cloth before proceeding to loosen the stopper.

H. A. (Dunbar).—*Non-Stripping Negatives.* We should strongly advise your keeping them as they are, although the paper may require frequent oiling. There is no method of transferring these negatives by destruction of the paper without injuring the gelatine film.

J. C. H.—*Electric Lighting.* You should advertise. We do not know of any photographic firm desiring an installation at the present time.

L. A. B.—*Uranium Toning.* Before placing absolute reliance on this process, good though the results may appear at first sight, take the precaution of exposing your prints to light, to see whether they are permanent. Dr. Anthony advocated the toning or intensification of collodion negatives with uranium many years ago, but was forced to abandon it when Mr. Jabez Hughes had shown that the effects were only transient.

M. A.—*Photographers' Benevolent Association.* Subscriptions are urgently needed if the good work is to be continued, the demand upon the funds during the present year having well-nigh exhausted the available resources intended to be applied in the way of relief, and some deserving cases are yet awaiting consideration. The Hon. Sec. is Mr. H. J. Beasley, 65, Chancery Lane, W.C.

Received.—Brighton and Aberdeen.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1725.—*September* 25, 1891.



CONTENTS.



## MILITARY PHOTOGRAPHY.

Among the various arts helped by photography, the art of war—if the business of killing people scientifically can be called an art—has, as yet, been most chary in its employment of the camera. Certain officers and special correspondents have, it is true, taken pictures of battlefields and their surroundings, and we have seen more than one photograph which has been actually taken "under fire." But these were not done under military authority, or to serve any military purpose, and may, therefore, be regarded as amateur productions which hardly touch the fringe of the subject before us. On the other hand we have, it will be remembered, a Photographic Section of the School of Military Engineering at Chatham, which has done a great deal of work in connection with big guns, in recording the havoc done to targets by their monster projectiles, and the effects upon various descriptions of armour plates by chilled and other shot. These useful photographs have frequently been exhibited, and are, therefore, more or less familiar to many of our readers. But so far as active work with an army in the field is concerned, photography has as yet done nothing.

The subject may really be regarded as a new one, for gelatine plates are not much more than a decade old, and before their introduction any use of the camera during the bustle of a campaign would have been voted impossible. No commander would have cared to have increased his impedimenta by a travelling dark room or tent, and such a collection of bottles and other paraphernalia as the collodion process entailed. But with the convenience of dry plates these difficulties at once disappear; the officer need no longer fear any noticeable addition to his kit, and it remains for him to consider whether any advantages are to be gained by employment of the camera on active service. This is a question that cannot very well be satisfactorily answered by a civilian, and we are therefore fain to turn to the pages of a little book by Captain Wheeler on "Military Photography," which has recently been issued by Messrs. Iliffe and Son.

Captain Wheeler points out, in the first place, that the camera would be a valuable aid in reconnoissance, although he admits that there are hundreds of well-informed and generally sensible persons who are convinced that the pencil is all-sufficient in making such rough sketches as alone are necessary. It is, unfortunately, the way with a certain class of minds to pooh-pooh in this way any new thing. They are so used to the old rut that they quite decline to avail themselves of a better path. There is an authentic story about the introduction of the first electric telegraph, which was submitted to a high Government official in this country, who, in his wisdom, expressed the opinion that such a means of communication was quite unnecessary, for the Semaphore system answered all needs. The introducer of military cameras may possibly have to deal with this exasperating kind of opposition, unless he is able to secure the goodwill of someone having influence with the authorities. But, setting this difficulty aside by supposing that all such opposition has been removed, in what way is it proposed to make use of the camera in a reconnoissance? Any object or feature of importance would, of course, be photographed instead of sketched as at present, and, if the conditions were favourable, the hand-camera would be the instrument used. Such pictures generally are not wanted until the return to camp, when the plates would be developed and printed by any quick development process. The taker of the pictures would not necessarily develop them himself, but might hand them over to a divisional photographic section, which it is recommended should be attached to an army corps. Such photographs might be combined with pencil draughtsmanship, so that one system could be made to check the other—the photographs for general views, and the pencil sketches for details.

The term "Photographic Section" is not meant to imply a large staff of workers; on the contrary, two specially trained men with a pony or mule-load of apparatus would be enough. These men would be under the control of the chief of the staff and divisional intelligence officers, and their work would comprise (1) the reproduction of plans, maps, sketches, &c., for distribution to various officers; (2) the photographing of special objects of interest, such as forts, bridges, &c., laying directly *en route*; and (3) in developing the plates of individual photographers, as already indicated. In certain cases, Captain Wheeler thinks that a stratagem would be necessary before a picture could be secured, and that such would be quite justifiable, on the old plea, we suppose—for he does not say so—that all is fair in love or war. He means that when the photographer, as is the case in some of the countries across the Indian frontier, is viewed with suspicion, he may, by use of a prism, take a photograph of an object at right-angles to the direction in which the lens points. The same ruse can also be adopted when a picture of fortifications, or of other objects of military interest, is wanted. He recalls the story of a German lady who wheeled her child in a perambulator in the vicinity of a certain fortified town in France, the said child being a dummy containing a photographic camera.

The author also says a few words about the possibility of taking photographs from balloons. But while recording some experiments of the kind which took place as long ago as the siege of Paris, he omits all mention of a camera designed by the late Mr. Woodbury for attachment to a small balloon expressly for military purposes. We also have the interesting story repeated of the manner in which, during the same siege, microscopic despatches were despatched by pigeon post from the devoted city. The concluding chapter of the book deals with hints on equipment. A half-plate camera is recommended for the work, and Pizzighelli and bromide paper are advocated as the most convenient printing processes for military purposes.

Captain Wheeler evidently considers that he has made out a good case for the employment of the camera in military operations. If his conclusions be correct, there will be little difficulty in giving the system a trial, for hundreds of officers have taken up the art as a pastime, and many are expert workers. It is a pity that, in support of his opinions, he cannot point to any past campaign where benefit would have accrued, or disaster turned aside, by use of the art for which he pleads with such ability.

The Folk-lore Society of Massachusetts have sent a delegation to Colonel Gouraud, asking his assistance to obtain, by means of the phonograph, records of the "street sounds" of London. In order to carry out this idea, the Colonel has placed a phonograph at the Society's disposal, and also a photographer, who will photograph the subjects simultaneously with the phonographing of their "sound-waves," thus enabling the coincident reproduction, in America and elsewhere, of both sights and sounds by means of the lantern and the phonograph combined. This will doubtless prove highly interesting to the New England savants, to whom we do not mind saying, in strict confidence, that four million London people would be delighted to learn that most of these sounds could be once for all bottled up, phonographically or otherwise, and exported for the delectation of our American kinsmen. If there were a duty on "street sounds" under the McKinley Tariff, they would pay it with positive pleasure.—*Daily Telegraph.*

## ILLUSIONS OF SIGHT.

BY REV. H. GORDON PALMER.

When we apply the powers of vision for any ultra purpose outside that designed, we may expect to discover imperfections similar to those Dr. Emerson and Mr. Goodall have recently advocated in a *striking* fashion. These limits so disclosed indicate that the perfection of the visual organ is practical, not absolute. The adaptation of the eye to its proper function cannot, I presume, be doubted. There is, however, a mystery in visual perception, in which we command the services of three such widely differing ministers as mechanism, mind, and spirit; and where we can trace the material organism, but the condition of consciousness remains inscrutable, we may affirm that the eye does not see of itself. We are first conscious of visual sensation as a limited power of translating signs, and then of visual perception as a *translation of such translation.* We are now face to face with mind and spirit. The material has served and vanished; we see with the mind. The external object and the image on the retina are, to the eye of a stranger, in a position the reverse of each other, and only for *something* inscrutable we should see things upside down. Dr. Emerson refers to this in a note, and wisely passes on.

While Dr. Emerson is merrily laughing at us, let us examine some illusions of sight, as, for instance: I watch the full moon rising, and observe how large and rotund she looks, resting, as it were, upon that eastern hill, and seen amidst the forest trees. If I look again through a slit in a card (Mr. Debenham's mistake) she immediately resumes her normal size. A painter and an ignorant laic stand before a painting or a lovely landscape, and how different are the impressions made, and with the same optical instrument!

Again, should I take a pseudoscope—invented by Wheatstone—and look steadily at a statue, at once the impression of solidity is gone; the face is a hollow mask. But if I look at a human face with it, flesh and blood refuse to so deceive me; in other words, my mind refuses to yield its long-accustomed impressions and habit. Still more, by an effort of will, I can overrule the natural process of physical impression, alter it, and *create* a designed effect; for, on first awakening in the morning, keeping the eyelids steadily closed, and now and then slightly separating the fringe of eyelashes with my fingers, I can produce colours more beautiful than nature's ordinary, and by practice I can control their appearance and succession. Everybody remembers once going to bed in the dark imagining a blow on the optic nerve from the bedpost; you duck your head, and behold, the room is suddenly filled with sparks and flames of fire. Under similar circumstances examine the eye, and you will find no light really in it. In dreams the images are wholly mental, and in few of these illusions can the mystery be traced solely to our sensory apparatus and its optical laws; such as may be observed in a lighted stick whirled rapidly round appearing as a circle of fire.

It is, I presume, a case of "about ship" with the talented and merry professor. We may be assured of the correctness of all he avers; he will make no mistake this time. Such and such are truly our sensuous impressions of vision, formed *now* by association, and inference, and habit, but (and here lies the question) are these, as stated by him, *the whole truth?*

Have great opticians like Mr. Dallmeyer no invention, no powers and resources to fall back upon, to approach mechanism to mind? Is not photography in its infancy, as painting was in the times of Thotmes III.? Even the old masters, I understand, are going out of fashion.

What I mean to infer is this; the minuteness and accuracy of photography, when projected, must affect the artistic impressions of nature presented to us as signs of things, the meaning of which (signs) we learn inductively by a process of self-education. The mind will oscillate between the beauty and perfection of now the one and now the other, until, for each individual will, the point of rest shall be decided. Sight and mind are under the law of development, and man invents improved mechanism, and finally the fittest instrument will survive.

## THE RATE OF EXPLOSIONS IN GASES.*

1. The results obtained with hydrogen and oxygen, with hydrogen and nitrous oxide, and with marsh gas and oxygen, in exact proportions for complete combustion, were in close accordance with the mean results of Berthelot. For ethylene, acetylene, and cyanogen my numbers differed appreciably, but in no case differed by more than seven per cent., from the rates observed by Berthelot:

Table II.—*Velocity of Explosion in Metres per Second.*

| | Berthelot. | Dixon. |
|---|---|---|
| Hydrogen and oxygen, $H_2+O$ ... ... | 2810 | 2821 |
| Hydrogen and nitrous oxide, $H_2+N_2O$ ... | 2284 | 2305 |
| Marsh gas and oxygen, $CH_4+O_4$ ... ... | 2287 | 2322 |
| Ethylene and oxygen, $C_2H_4+O_6$ ... ... | 2210 | 2364 |
| Acetylene and oxygen, $C_2H_2+O_5$ ... ... | 2482 | 2391 |
| Cyanogen and oxygen, $C_2N_2+O_4$ ... ... | 2195 | 2321 |

The general agreement between these measurements left no room for doubt about the substantial accuracy of Berthelot's experiments. The formula he gives does therefore express, with a close degree of approximation, the rates of explosion of many gaseous mixtures.

2. The formula fails for the explosion of carbonic oxide with oxygen or nitrous oxide. This was to be expected if—in the detonation of carbonic oxide in a long tube—the oxidation is effected indirectly by means of steam, as it is in the ordinary combustion of the gas. Measurements of the rate of explosion of carbonic oxide and oxygen in a long tube showed that the rate increased as steam was added to the dry mixture, until a maximum velocity was attained when between five and six per cent. of steam was present.

3. When electrolytic gas was mixed with an excess of either hydrogen or oxygen, the rate of explosion was found to be altered; the addition of hydrogen increasing the velocity, the addition of oxygen diminishing it. The addition of an inert gas, nitrogen, incapable of taking part in the chemical change, produced the same effect as the addition of oxygen—one of the reacting substances—only the retarding effect of nitrogen was less marked than that of an equal volume of oxygen. The retardation of the explosion-wave caused by the addition of an inert gas to electrolytic gas evidently, therefore, depends upon the volume and the density of the gas added. In the following table the retarding effect of oxygen and nitrogen on the explosion of electrolytic gas is compared:—

Table III.—*Rate of Explosion of Electrolytic Gas with Excess of Oxygen and Hydrogen.*

| | | | | |
|---|---|---|---|---|
| Volume of oxygen added to $H_2+O$ ... ... | $O_1$ | $O_3$ | $O_5$ | $O_7$ |
| Rate ... ... ... | 2328 | 1927 | 1690 | 1281 |
| Volume of nitrogen added to $H_2+O$ ... ... | $N_1$ | $N_3$ | $N_5$ | $N_7$ |
| Rate ... ... ... | 2426 | 2055 | 1822 | — |

* Concluded from page 652.

I think it a fair inference from these facts to conclude, when the addition of a gas to an explosive mixture retards the rate of explosion by an amount proportional to its volume and density, that such added gas is inert as far as the propagation of the wave is concerned, and that any change which it may undergo takes place after the wave-front has passed by—in other words, is a *secondary* change.

This principle has been applied to determine whether, in the combustion of gaseous carbon, the oxidation to carbonic acid is effected in one or two stages—an important question, on which there is little experimental evidence. If, for instance, in the combustion of a hydro-carbon, or of cyanogen, the carbon is first burnt to carbonic oxide, which subsequently is burnt to carbonic acid, the rate of the explosion-wave should correspond with the carbonic oxide reaction, in this case the primary reaction; whereas, if the carbon of these gases burns to carbonic acid directly, in one stage, then the rate of the explosion-wave should correspond with the complete reaction.

Now, if we adopt Berthelot's formula as a working hypothesis, we can calculate the theoretical rates of explosion of marsh gas, ethylene, or cyanogen—(1) on the supposition that the carbon burns directly to $CO_2$; and (2) on the supposition that the carbon burns first to CO, and the further oxidation is a subsequent or secondary reaction. On the first supposition, if 100 represents the rate of explosion of these three gases burning to carbonic oxide, the addition of the oxygen required to burn the gases to carbonic acid should *increase* the rate of explosion:—

| | Marsh Gas. | Ethylene. | Cyanogen. |
|---|---|---|---|
| Calculated rate of explosion when burnt to $CO_2$ ... ... ... | 104 | 103 | 107 |

Whereas if these gases really burn first to carbonic oxide, and the extra oxygen is inert in propagating the explosion-wave, then the addition of this inert oxygen would diminish the rate of explosion:—

| | Marsh Gas. | Ethylene. | Cyanogen. |
|---|---|---|---|
| Calculated rate of explosion when burnt to CO with inert oxygen present ... ... | 92 | 88 | 87 |

The experiments show that if 100 be taken as the rate of explosion when the oxygen is only sufficient to burn the carbon to carbonic oxide, the following are the rates found when oxygen is added sufficient to burn the carbon to carbonic acid.

| | Marsh Gas. | Ethylene. | Cyanogen. |
|---|---|---|---|
| Rates found ... ... | 94 | 92 | 84 |

The results are, therefore, in favour of the view that in the explosion of these gases the carbon is first burnt to carbonic oxide.

But stronger evidence on this point is obtained by comparing the explosion rate of these gases (1) when fired with oxygen sufficient to burn the carbon in them to carbonic acid; and (2) when nitrogen is substituted for the oxygen in excess of that required to burn the carbon to carbonic oxide. We have seen that oxygen added to electrolytic gas hinders the explosion more than nitrogen. In precisely the same way, oxygen added to a mixture of equal volumes of cyanogen and oxygen hinders the explosion more than the same volume of nitrogen. The conclusion we must come to is, that the oxygen added to the mixture expressed by the formula $C_2N_2+O_2$ is as inert—so far as the propagation of the explosion-wave is concerned—as oxygen added to the mixture expressed by the formula $H_2+O$. The same phenomena occur in the explosion of marsh gas, ethylene, and acetylene. In all these cases the substitution of nitrogen for the oxygen required to burn the carbon from carbonic oxide to carbonic acid *increases* the velocity of the explosion. These facts seem only consistent with the view that the carbon burns directly to carbonic oxide, and the formation of carbonic acid is an after-occurrence.

Finally, the rates of explosion of cyanogen and the hydrocarbons, when their carbon is burnt to carbonic oxide, have been found greater than the velocities calculated from Berthelot's formula. This accords with the observation previously made, that the rate of explosion of electrolytic gas with excess either of hydrogen or oxygen is far higher than the calculated rate. It would seem probable that the theoretical rates as calculated by Berthelot should be modified, in spite of the close agreement which his numbers show. I think the low rates found, when hydrogen marsh gas, cyanogen, &c., are exploded with equivalent proportions of oxygen, depend partly on the carbon burning to carbonic oxide, and partly on the dissociation of the steam at the high temperature. If the formula is modified in these respects, velocities can be calculated which agree with the experimental results where dissociation does not occur. I suggest the following modifications:—(1) The specific heats should be taken at constant volume instead of at constant pressure; (2) the density of the gas should be taken as the mean of the burnt and unburnt molecules, instead of that of the burnt molecules alone; and (3) a correction should be made for the alteration of volume by the chemical reaction, which in some cases increases, in others diminishes, the volume.

The rates so calculated agree with the explosion rates of cyanogen when burnt to carbonic oxide either by oxygen, nitrous oxide, or nitric oxide; with the explosion rates of hydrogen and oxygen, with a large excess either of hydrogen, oxygen, or nitrogen; with the explosion rates of ethylene and acetylene, with oxygen and a large excess of nitrogen; and, lastly, with the explosion rates of hydrogen and chlorine, with an excess of hydrogen.

In conclusion, I would say that these experiments have amply confirmed the truth of Berthelot's statement, that the explosion-wave is a "specific constant" for every gaseous mixture; that it has been shown that the rate of explosion depends upon the primary reaction occurring, and that the determination of the rate may throw some light on what is now so obscure—the mode in which chemical changes are brought about; and, finally, that it does not seem impossible that a connection between the rate of the molecules and the rate of the explosion may be worked out, which will give us some definite information on points of high interest in the theory of gases.

The Borax Fields of South America.—The appearance of an inland sea in California is causing great anxiety regarding the supply of borax and boracic acid. Mr. Robottom, a gentleman who is well-informed upon the subject, says that if the Californian supply should fail, there is sufficient crude borax in Chili, Peru, and Bolivia to supply the markets of the world. One deposit which Mr. Robottom visited on the borders of Chili and Bolivia he describes as being twenty-six miles in length, and from three to six miles in width. The high Andes and many of the valleys of these districts are, according to Mr. Robottom, covered with borax.—*Dalziel.*

## CHICAGO EXHIBITION, 1893.

As many of our readers will doubtless wish to know under what conditions they can exhibit at the coming World's Fair at Chicago, we print the following general regulations which have been framed by the Government of the United States, so far as foreigners are concerned. The articles exhibited will not be subject to any duties, fees, or charges of any kind:—

### General Regulations for Foreign Exhibitors.

1. The Exhibition will be held on the shore of Lake Michigan, in the city of Chicago, and will be opened on the 1st day of May, 1893, and closed on the 30th day of October following.

2. All governments have been invited to appoint commissions for the purpose of organising their departments of the Exhibition. The director-general should be notified of the appointment of such foreign commissions as soon as the appointment is made.

Diagrams of the buildings and grounds will be furnished to the foreign commissions on or before January 1st, 1892, indicating the localities to be occupied by each nation—subject, however, to revision and readjustment.

3. Applications for space, and negotiations relative thereto, must be conducted with the commission of the country where the article is produced.

4. Foreign commissions are requested to notify the director-general not later than June 1st, 1892, whether they desire any increase or diminution of space offered them, and the amount.

5. Before November 1st, 1892, the foreign commissions must furnish the director-general with approximate plans, showing the manner of allotting the space assigned them, and also with lists of their exhibitors, and other information necessary for the preparation of the official catalogue.

Products brought into the United States at the ports of Portland, Maine, Boston, New York, Philadelphia, Baltimore, Tampa, New Orleans, San Francisco, Wilmington, Portland, Oregon, Port Townsend (Wash.), Seattle (Wash.), Tacoma (Wash.), and Chicago (Ill.), or at any other port of entry, intended for display at the International Exhibition, will be allowed to go forward to the Exhibition buildings, under proper supervision of customs officers, without examination at such ports of original entry, and, at the close of the Exhibition, will be allowed to go forward to the port from which they are to be exported. No duties will be levied upon such goods, unless entered for consumption in the United States.

6. The transportation, receiving, unpacking, and arranging of the products for exhibition will be at the expense of the exhibitor.

7. The installation of heavy articles requiring special foundations or adjustment should, by special arrangement, begin as soon as the progress of the work upon the building will permit. The general reception of articles at the Exhibition buildings will commence on Nov. 1st, 1892, and no articles will be admitted after April 10th, 1893.

8. Space assigned to foreign commissions, and not occupied on the 10th day of April, 1893, will revert to the director-general for reassignment.

9. If products are intended for competition, it must be so stated by the exhibitor; if not, they will be excluded from the examination by the international juries.

10. An official catalogue will be published in English, French, German, and Spanish. The sale of catalogues is reserved to the World's Columbian Exposition.

The twelve departments of the classification which will determine the relative location of articles in the Exhibition—except in such collective exhibits as may receive special sanction—also the arrangement of names in the catalogue, are as follows:—(*a*) agriculture, forest products, forestry, machinery, and appliances; (*b*) viticulture, horticulture, floriculture; (*c*) live stock—domestic and wild animals; (*d*) fish, fisheries, fish products, and apparatus for fishing; (*e*) mines, mining, and metallurgy; (*f*) machinery; (*g*) transportation — railways, vessels, vehicles; (*h*) manufactures; (*j*) electricity; (*k*) fine arts—pictorial, plastic, and decorative ; ($l$) liberal arts—education, engineering, public works, architecture, music, and the drama ; ($m$) ethnology, archæology, progress of labour and invention, isolated and collective exhibits.

11. Foreign commissions may publish catalogues of their respective sections.

12. Exhibitors will not be charged for space.

A limited quantity of steam and water power will be supplied gratuitously. The quantity of each will be settled definitely at the time of the allotment of space. Any power required by the exhibitor in excess of that allowed will be furnished by the World's Columbian Exposition at a fixed price. Demands for such excess of power must also be settled at the time of the allotment of space.

13. Exhibitors must provide, at their own cost, all show-cases, shelving, counters, fittings, &c., which they may require, and all countershafts, with their pulleys, belting, &c., for the transmission of power from the main shafts in the building where the exhibit is located. All arrangements of articles and decorations must be in conformity with the general plan adopted by the director-general.

Note.—The general plan requires all decorations, signs, &c., to be in harmony with the dignity and magnitude of a magnificent exhibition, and the director-general is empowered to secure this result.

The World's Columbian Exposition will take precautions for the safe preservation of all objects in the Exhibition, but it will in no way be responsible for damage or loss of any kind, or for accidents by fire or otherwise, however originating.

Note.—A thoroughly equipped fire department will protect the buildings and exhibits, and a large police force will maintain order. The entire Exposition grounds will be under the immediate supervision of the City of Chicago and of the State of Illinois. A guard, equal to any possible contingency, is thus provided, the municipal authority being upheld, if necessary, by the State troops, and the State by the army of the United States, so that no apprehension need arise as to losses resulting from lawlessness.

14. Favourable facilities will be arranged by which exhibitors or foreign commissions may insure their own goods.

Note.—Special care has been taken to render everything about the Exposition as nearly fire-proof as possible ; and it is reasonably certain that the rates of insurance will not be excessive, but, on the contrary, very reasonable. Exhibitors may insure in any company, foreign or domestic. Arrangements will be made with English, French, German, and American companies to fix uniform or special rates on exhibits and buildings, so that no advantage will be taken of any exhibitor who wishes to insure his goods.

Foreign commissions may employ watchmen of their own choice to guard their goods during the hours the Exposition is open to the public, subject to the rules and regulations of the Exposition.

15. Foreign commissions, or such agents as they may designate, shall be responsible for the receiving, unpacking, and arrangement of objects, as well as for the removal at the close of the Exposition ; but no person shall be permitted to act as such agent until he can give to the director-general written evidence of his having been approved by the proper commission.

16. Each package must be addressed, "To the Commission (name of country) at the World's Columbian Exposition, Chicago, United States of America," and should have at least two labels affixed to different, but not opposite, sides of each case, and give the following information :—

17. (1) The country from which it comes ; (2) name of firm of the exhibitor ; (3) residence of the exhibitor ; (4) department to which objects belong ; (5) total number of packages sent by that exhibitor ; (6) serial number of that particular passage.

18. Within each package should be a list of all objects.

19. If no authorised person is at hand to receive goods on their arrival at the Exposition buildings, they will be removed without delay, and stored at the risk and cost of whomsoever it may concern.

20. Articles that are in any way dangerous or offensive, also patent nostrums and empirical preparations whose ingredients are concealed, will not be admitted.

21. The removal of goods on exhibition will not be permitted prior to the close of the Exhibition.

Note.—Articles not on exhibition for competition may be sold under special permit.

22. Sketches, drawings, photographs, or other reproductions of articles exhibited will only be allowed upon the joint assent of the exhibitor and the director-general ; but views of portions of the building may be made upon the director-general's sanction.

23. Immediately after the close of the Exhibition exhibitors shall remove their effects, and complete such removal before January 1st, 1894 ; goods then remaining will be removed and sold for expenses, or otherwise disposed of under the direction of the World's Columbian Exposition.

24. Each person who becomes an exhibitor thereby acknowledges and agrees to be governed by the rules and regulations established for the government of the Exhibition.

Special regulations will be issued concerning the exhibition of fine arts, awards, the organisation of the international juries, and sales of special articles within the buildings, and on other points not touched upon in these preliminary instructions.

25. All communications concerning the Exhibition will be addressed to the Director-General, World's Columbian Exposition, Chicago, Illinois, U.S.A.

The management reserves the right to explain or amend these regulations whenever it may be deemed necessary for the interest of the Exhibition.

George R. Davis,
*Director-General.*

Walker Fearn,
*Chief Department of Foreign Affairs.*

---

Mr. W. H. Dale Vallon, under the imposing title of "The Scientific Alliance," has opened a factory for optical and electrical apparatus at Dyer's Buildings, Holborn, E.C.

People's Palace Technical Schools, Mile End Road, E.—The fifth winter course of technical and practical instruction in photography will be commenced on Thursday, October 1st, at eight p.m. ; lecturer, Mr. Charles W. Gamble.

It is not unlikely, says the *New York Times*, that importers of music, pictures, including etchings, photographs, &c., and a large contingent of lovers of these things who are not dealers, will unite in a protest to the Secretary of the Treasury against the ruling which instructs the customs officers to confiscate these articles when sent through the mails from foreign countries. The ruling referred to has been in effect since July 28th. Importers of such articles whom a *Times* reporter talked with, said that it not only brought no revenue to the Government, but it imposed such restrictions as to amount to prohibition of importations. The situation was explained thus. "Books imported are dutiable under a special clause in an Act of long standing. Special provision, however, is made that they may be received through the mails. Other classes of printed matter subject to duty are not provided for, and under the action of the Postal Convention these dutiable goods may not be sent by mail. Consequently, an order has been issued to seize all such articles. They must come through the Custom House by the express lines." Since this order took effect the customs department at the Post Office has been doing a rushing business. All sorts of packages have been seized, and the total amount of work of this department has been increased about 100 per cent. Prior to the order the seizures numbered about 250 a month. In the twenty days that the wholesale confiscations have been in process, the number has increased to such an extent that at the end of the first month it is estimated that the total of seizures will be about 1,700. The goods taken are to a large extent pictures, although many bundles of music have been stopped on their way to the dealers and sent to the Custom House, to be redeemed under penalties, or sold. The men interested have been powerless. Their correspondents abroad have been sending goods as of old, and confusion and loss have resulted.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

HELIOCHROMY—REDUCING HARD NEGATIVES—HYALINE—DEVELOPER FOR GELATINO-BROMIDE PRINTS—SOLUBILITY OF ZINC.

*Heliochromy.*—To judge from a leader in the *Phot. Archiv*, it seems that a new step forward has been made in the solution of the problem of photographing in the colours of nature. It is said that a young scientist of Munster, in Switzerland, Dr. R. Kopp, who has been engaged with heliochromic experiments for three years, has elaborated a method which enabled him to obtain, with comparatively short exposures, photographic prints on which the various colours are produced all at the same time, and not separately, as is the case with the method of Professor Lippmann. The working details of this much-promising method are, of course, not published by the author, but he claims the following. All the colours and tints, together with black and white, are produced directly by means of a heliochromic process. The time of exposure is a comparatively short one, requiring from thirty to fifty seconds in direct sunlight. The prints, after being fixed, keep very well, only if exposed to the action of direct sunlight they will suffer to a slight degree. The editors of the above-mentioned journal, judging from the prints the author has sent to them, state that the prints have been obtained from transparencies and diapositives on glass; red, violet, yellow, and green being well represented, the lights of the pictures being purely white. The latter is of special value, it being well known that all the predecessors of the author found special difficulty in producing a pure white on their heliochromic pictures. Even the heliochromic prints obtained by Veress show a yellowish-brown ground. The author has also made experiments to produce the colours directly in the camera, and he says that especially the yellow and the green of the trees and of the meadows are reproduced quite naturally. He has no doubt that his process will be soon perfected.

*Reducing Hard Negatives.*—The following method, recommended by P. Ladewig, has proved in my hands to be a good one in the case of too hard negatives which are to be reduced. The negative, after being fixed and thoroughly washed, is placed in the following solution:—

| | |
|---|---|
| Bichromate of potash ... ... ... | 1 gramme |
| Hydrochloric acid ... ... ... | 3 grammes |
| Alum ... ... ... ... ... | 5 ,, |
| Water ... ... ... ... | 100 to 150 c.c. |

As soon as the negative is thoroughly bleached, it is well washed until the yellowness has disappeared, and then placed (in daylight) in any old or diluted developing solution. The image is developed slowly, and, at first, on the surface, so that the details in the shadows will be perfectly distinct before the lights have acquired sufficient density. By observing the negative image repeatedly by transmitted light, it will be easy to ascertain the point at which its density will be sufficient; it is then well rinsed, and the remaining silver chloride which has not been decomposed is removed by fixing the negative in hypo. I am quite aware that the method is not new, but it is a good one which deserves to be recommended afresh.

*Hyaline.*—A new material has been invented by F. Eikstein called "hyaline," which resembles externally the well-known celluloid; but whilst the latter is manufactured by combining camphor with nitro-cellulose, the new material contains other resinous substances instead of camphor—for instance, copal, dammar, shellac, or a mixture of them. It is very tough, semi-transparent, very extensible, odourless, and much less inflammable than celluloid; it may even be rendered entirely incombustible. The new material should be tried by manufacturers for photographic purposes.

*Developing Gelatino-Bromide Prints.*—The following developer is highly recommended by Dr. F. M. Eder for gelatino-bromide paper, it giving prints with perfectly clear whites. Two solutions are prepared:—

*Solution* No. 1.

| | |
|---|---|
| Pyrogallic acid... ... ... ... | 4 grammes |
| Potassium meta-bisulphite ... ... | 1·5 gramme |
| Distilled water... ... ... ... | 100 c.c. |

This solution keeps for many weeks if kept in a well-stoppered bottle.

*Solution* No. 2.

| | |
|---|---|
| Crystallised soda ... ... ... | 10 grammes |
| Sodium sulphite ... ... ... | 15 ,, |
| Distilled water... ... ... ... | 100 c.c. |

For use, equal parts of solution No. 1 and No. 2, and of distilled water, are mixed. This developer acts less energetically than the ordinary pyro-soda developer, but by increasing the quantity of the soda, and by diminishing the bulk of the water, the intensity of the pictures may be much increased.

*Why Chemically Pure Zinc is Sparingly Soluble in Acids.*—It is a well-known fact to photographers that chemically pure zinc is almost insoluble in diluted cold sulphuric acid, and that only nitric acid attacks this metal in the chemically pure state. The reason for this strange behaviour of the zinc has not, however, been sufficiently cleared up hitherto. Jul. M. Weeren has now made experiments in this direction, and he found that the chemically pure zinc is very sparingly soluble in acids because, directly it is immersed in the acid solution, it is surrounded by a condensed hydrogenic atmosphere, by which, in normal circumstances, a further attack of the acid is rendered impossible. In the case of nitric acid, the hydrogen which is formed on the zinc surface is, immediately after its formation, oxidised by the acid, so that it cannot condense itself in the form of a protecting covering around the zinc. A means to remove the protecting hydrogenic atmosphere from the pure metal consists in boiling the acid. Whilst at 0° the diluted sulphuric acid dissolved only 2·1 milligrammes of the metal, the quantity of the dissolved metal amounted to 9·8 mg. at 98°, and at 100° it amounted to 122·1 mg.

---

THE Fry Manufacturing Company have just issued supplementary catalogues containing full description and price list of their dry plates, lantern plates, celluloid films, enlargements on opal, paper, and canvas; bromide paper, ready-made developers, and all the other useful things which this Company deals with in such vast quantities. It can be truly said that the quality of these goods is as good as the quantity is great.

THE camera is not without its practical side. On at least one of the railroads running out of Boston, a camera is used in the legal department to take pictures of wrecks and other matters wherein a presentment of the situation can be made pictorially. A photograph tells the whole story at a glance; and not only does it save time, and therefore money, but it tells the story much better than words could possibly do it. The road in question, it is stated, has saved many thousand dollars in successfully opposing claims for damages which, but for the camera with its picturesque portrayal of the situation, it would have been compelled to pay.—*Boston Transcript.*

## PRACTICAL DEVELOPMENT.

BY W. S. WATERBURY.

It seems to me that there is no photographic subject that needs atteution any more than the above, as on it depends the success of the picture. It is of far more moment, from my point of view, than the exposnre, becanse, with judicions development, incorrect exposure can be corrected to a great extent—provided, of conrse, the error is within the bounds of reason.

I once heard a prominent experimenter say that there was no such thing as over or nnder-exposnre. Of conrse this was an extravagant statement; bnt it conveys a good idea as to what can be accomplished by intelligent development.

I believe in a full exposure. Allow the light ample time to act on the sensitive film, for without sufficient light action, tons of chemicals cannot prodnce a picture. Then the great advantage of a fnll exposnre is that yon gain an abnndance of detail in the shadows. It has been snggested to expose for the shadows and let the lights take care of themselves, and in most cases this is a good maxim.

True it is that under-exposure is sometimes unavoidable, and in that case some developers and a different mode of applying them may, to some extent, help it; bnt I would lay more stress upon allowing an ample amount of light to act on the plate. If yon do instantaneous work, be careful to have a lens and plate sufficiently rapid, and yon will have little trouble.

Now as to the choice of your developer. While I advocate the nse of no particnlar formula, I would suggest that, whichever one be used, always give preference to the one with two solutions, as it gives better control of development by allowing you to regulate the proportions of the alkali. I think that all formnlas are of nearly equal merit if used properly, and in two solutions. I nse the Chantanqua developer (pyro and potash), taken from the "Annnal" for 1891, page 331, formula No. 55, and I consider it as good as any for all around nse; either the above or eikonogen, prepared after any of the standard formulas, if in two solntions. I consider the choice of developers of far less importance than the manner of applying them, and, while eikonogen may be somewhat more difficult to manage, it certainly has a decided advantage in that it does not discolour the hands, besides giving more detail, especially in under-exposed plates.

To begin with, I hold that the strength of the developer mnst be suited to the exposure, rather than the exposure snited to the developer, as the ever-changing condition of light and the varying of the time of exposures, together with the difference in the sensitiveness of plates, render it impossible to make exposnres alike; therefore to follow any set rnle for applying a developer of uniform strength is impracticable.

Now as to the best way to apportion our developer to suit the various exposures. For example, let ns suppose a plate to be either correctly or over-exposed, and we are nsing the pyro developer; in either case we proceed as follows. Take the prescribed amount of water and add the pyro to it, keeping the potash separate, diluted with a little water, and add abont ten drops at a time to the pyro, each time flowing over the plate, and allowing a few minntes for it to act at each application. Continue to add the potash only until the image is well out, as you have now arrived at the proper strength; in other words, you have snited the developer to the exposure; now continue the development until the proper density is attained, but shonld it be slow in coming, add another dram of pyro. By these means a plate that is mnch over-exposed can be made to yield a brilliant negative. The above manipnlations can be observed in the use of any two-solntion developer, the idea being to approach the proper strength by the gradnal introduction of the alkali; bnt in some cases of extreme over-exposure it is a good plan to introdnce both the pyro and alkali by degrees, adding each as the progress of the plate may indicate.

Next let us suppose a plate to be under-exposed. In this case take one dram of the potash and mix with four onnces of water, and flow over the plate, and allow it to act for a few minntes. While this is doing its work, prepare the developer as described in the formula, excepting that double the amount be used. Now throw off the first bath, and withont rinsing flow with the developer, and allow this to act until sufficient detail has been obtained. If successfnl in this, add another dram of the pyro, and continue development until the desired density has been attained, but if not snccessfnl in this, the plate has probably been hopelessly under-exposed, bnt there is still a possibility of improving it by using another bath of full strength.

These manipnlations may also be observed in the use of any two-solution developer, the idea being in this case to first stimnlate the plate with the alkali, then apply the developer proper, only in a diluted state, and finally finish with developer, fnll strength.

Freqnently, when developing a plate, the sky and other strong lights appear long before the detail in the shadows, and in such a case take the plate from the bath and apply the alkali gently with the finger on the parts that are in shadow, and plnnge immediately in the bath again, being careful not to keep it from the bath long enongh to make sharp lines, and repeat the operation nntil sufficient detail has been secnred in the shadows, then continue development until sufficiently dense. In this manner the shadows can be forced independently of the high-lights, and amply developed without over-developing them. I have often developed a plate almost entirely by local application, as described above, with the most satisfactory results.

Inasmnch as the plate will always lose density in the fixing bath, in each and every case the development should be carried beyond the density desired in the finished negative.—*Photographic Times.*

---

The Cowles Electric Smelting and Aluminium Company, Lockport, N.Y., have reduced the price of their best aluminium to 50 cents per pound in ton lots. Now is the time to put the wonders that cheap aluminium would accomplish to the test; 50 ceuts a pound makes aluminium about as cheap as copper, taking capabilities of the two metals into consideration.—*Invention.*

A correspondent of the *Journal of the Photographic Society of India* says that for attaching lantern slide bindings to the glass nothing is better than bichromated paste, which is made as follows:—

| | |
|---|---|
| Flour ... ... ... ... | 2 teaspoonfuls |
| Water ... ... ... ... | 4 ounces |
| Bichromate of potash ... ... | 5 grains |

The flour must be rubbed to a smooth batter with the water, then placed in a saucepan over a fire, and kept stirred till it boils. Add the bichromate slowly, stirring all the time. Then stand to cool. *This paste must be kept in the dark;* and used as soon as possible. *Soak* the paper in it, attach to the glass, and then place in direct sunlight for a day.

## Notes.

Reference to any history of engraving will show that at one time the task of producing even a small printing block was a very serious affair indeed, often entailing more than one solemn confabulation between author, artist, engraver, and publisher. Photography has long ago changed all this, and an illustration which, under the old state of things, would tax the attention of a man for three or four days, can now be produced automatically from any pen-and-ink sketch in a less number of hours. Only instead of one sketch being in question, many are now photographed on one plate, and etched in one bath, a whole batch being treated at once. This power of wholesale production has led to one curious result, namely, the production of blocks of popular subjects, which can be multiplied by the electrotyping process indefinitely, and placed on the market for purchase by any of the thousands of newspapers which now exist in our own and other countries.

Here, before us as we write, is a publication known as "Vanoni's Weekly Sheet"—being events of the day illustrated. This particular number bears the impressions from thirteen different blocks, comprising three or four portraits of more or less prominent persons, scenes from a new play, H. R. H. at Heidelberg, and so on. In the margin is a short description of each event, from which a practised writer could soon evolve an expanded account, and the price at which each block will be supplied—averaging about fourpence per square inch—is placed against each cut. This system will be a boon, no doubt, to the provincial papers, particularly if each has the monopoly of the illustrations so far as its own town is concerned. The idea, we may add, is not exactly new. Some years ago Messrs. Cassell issued blocks and stereotyped matter for the use of provincial journals, but we do not know whether they are doing so still.

It has been suggested to us that the modern photographic portrait is so often entirely spoilt by the particular style of dress which may happen to be fashionable at the time, that it would be well if it became the rule to attire sitters in simple classical drapery. The notion is certainly a good one from the artistic point of view, and would be hailed with delight by people of good carriage and fine physique. But how about the great majority of ordinary people, and those who have the somewhat common deformity of abnormally large features? Many of these would look supremely ridiculous when thus equipped, and would certainly avoid the photographic studio if their presence there involved such trappings.

It is, unfortunately, true that modern fashions often are fatal to artistic effect; but there is a style of dress which now seems to be in vogue which is still more objectionable than the deforming projections which are now getting out of date—we mean the imitation by the ladies of masculine dress. Jackets with pockets at the sides, striped shirt-fronts, studs, stand-up collars, sailor's knots, cuffs, &c.—all are complete. Such a get-up is to most men the reverse of attractive. W. S. Gilbert, in *Patience*, chaffed the æsthetic young man with his feminine manners to extinction, and now there needs someone to extinguish the masculine young woman. At any rate, when she comes to be photographed, let her put aside her tailorings, and bedeck her, if not in classical garb, in some more suitable attire.

If anything "new" concerning photography is wanted, the place to look for it is the society journal. These authorities have the knack of making discoveries which rarely find their way into the photographic press. The only fault to be found with these novelties is that, after their first announcement, nothing more is heard of them. We hope this will not be the case with the "new process" of a Stuttgart photographer, which, according to the *Court Journal*, goes by the name of "Natural Photography." "Natural Photography" consists in the taking of life-size portraits direct in the nineteenth part of a second. The Stuttgart photographer uses a combination of daylight and the flash-light, and employs a "transposed camera," whatever this may be. Life-size portraits taken direct are no novelty in England. There was once a craze in this direction. Some twenty years ago the late Robert Crawshay offered a prize for the best production of the kind—a contest which flooded the Pall Mall Exhibition of that year with Brobdignagian atrocities.

It is quite possible new "readings" in the performances of Beethoven's symphonies may result from Sir George Grove's proposal to have the original manuscript photographed for the information of musicians. Errors in copying band parts are frequent enough, and possibly the bewilderment the first rehearsals occasioned the orchestra of nearly a century ago was due, in some degree, to this cause. But though these errors may have since been corrected, it may be some marks of expression with which the manuscript abounds, to say nothing of the changes and corrections that, as Sir George Grove says, "crowd the pages," have been incorrectly transcribed. Indeed, Sir John Stainer says, "In certain parts of his symphonies we are not quite sure to this day whether we are playing the right notes." Anyway, if the scheme be carried out, musicians will be grateful to photography for the boon it will place in their hands.

The Berlin Chemical Society have lately had brought before them two instances where forgery was detected by means of photography. In each case an ink different in colour from that of the original was used by the forger, and, though the tints were apparently the same to the eye, the sensitive plate revealed the difference. There is, of course, nothing new in this, but it is well that the detective powers of photography in this direction should be kept in mind.

Varied, indeed, are the uses of photography. The newspapers record the feat of an American tourist who, being denied admission to an old church up in the mountains of Mexico, had his curiosity and ambition excited, and, after drugging the custodian, went at night inside the building with his camera and flash-light, and secured the picture of a statue of the Virgin made of solid gold. From France comes the story of the capture in some dye works of a German, also armed with a camera and magnesium powder, which he intended to employ in the photographing of certain machinery in order to discover some trade secrets. Thirdly, we see the *Trades Unionist* photographing the distorted appearance of the unfortunate employées in chloride of lime works. And all this within a week!

## PHOTOGRAPHIC ARCHÆOLOGY.

BY JAMES MEW.

Dionysius of Halicarnassus and Flavius Josephus gave the name of archæology, the former to his book relating to the origin and commencement of Rome, the latter to his history of the nation of the Jews. The archæology which is the subject of the present article was born in the period of the Renaissance, and cradled in the Middle Ages. It has been somewhat invidiously described by Balzac as the passion—or, to speak with greater accuracy, the mania—which misleads old gentlemen into the belief that they are yet alive. This is scarcely an exact definition; it is rather of the sort which proceeds from the mouths of those who sit in the seats of the scorners. Seriously described, it is the science which, treating of antiquity, investigates it by the study of such aids to its interpretation as monuments and manuscripts. The reproduction of these by means of photography is one of the most important of the many useful applications of this excellent art.

In the matter of monuments, the ingenious photographic artist has, in the words of Gray's "Bard," "ample room and verge enough." At his own sweet will he may disport himself among those huge megalithic structures to be found alike in Europe, Asia, and America, called in the Celtic "dolmens," and in the Welsh "cromlechs." He may amuse himself in Devonshire and Cornwall by taking these supposed sepulchral monuments in every variety of posture and condition; or he may transfer to his sensitive plate those mysterious bones, rude implements of warfare, cooking, or ornament—it is, alas! too often uncertain which—found sometimes in the cinerary urns which these so-called table-stones enclose. But in "taking" photographically the treasures revealed by them there must be no hesitation and no delay. Exposed after ages of interment to a new and sudden life of sunshine and of air, they crumble rapidly away, and, if not taken in time, are lost to the procrastinating photographer for eternity. It is true that much matter of antiquarian interest in England, as in India and Egypt and Palestine and Greece and Rome, has been already ably pictured by photographers now dead and gone, but the artist of the present may still feed on the crumbs which have fallen from their sumptuous table. He may still spend a happy day—not, indeed, of that order of felicity to be found in Rosherville, but of a staid and subdued character—in the vaults of the British Museum; or, if his fiscal resources allow it, he may take copies of Pugins' church at Ramsgate; or he may go still further afield, and find a very picture-book of antiquity in the ancient pine forests and solemn streets of sad Ravenna, that fossilised city in which Byron wrote his "Faliero," and the author of the Divine Comedy sleeps his everlasting sleep.

The camera is equally useful in preserving records of monuments, of architecture or of sculpture, of painting or of engraving, ordinary or extraordinary, civil or military, social or domestic, sacred or profane. The photographer who has occupied his leisure hours with the study of architecture may take portraits of walls, houses, temples, obelisks, pyramids, theatres, tombs, and public highways to his heart's content. He who is fond of sculpture has only to set his camera before statue, bust, or bas-relief, to obtain iconographic photographs. He who is interested in paintings—and what artistic photographer is not?—has no lack of frescoes, and pictures on papyrus, or canvas, or wood, and of mosaics, those geometric drawings on stone. He who busies himself with engravings may carry away with him his photographic glyptographs; while numismatic photographs will be his who delights in medals, of every time and country, with inscriptions in every tongue, on every kind of material. The world of literature and art is all before him where to choose. He may busy himself with the reproduction of old writings, or picture a sword or a helmet, a lamp or a goblet, a bracelet or a ring, the furniture of the men and women who lived, and moved, and had their being in the long dead past, in the ancient world of Assyria and Egypt, of Greece and Rome. As a literary archæologist, he may learn not only to know for himself, but also to describe to others the works of human interest in all the periods of the past, and to perpetuate by his photographic skill the memory of those monuments which the remorseless hand of time is ever ready to convert into mouldering ruin.

To the student, the work of the paleographic photographer is of the greatest value. The pictures of inscriptions furnished by the camera are convenient to the scholar for the prolonged study which is generally required for their decipherment. No sketch made by any human artist will be able to equal the absolute exactitude of the photographic lens, which, moreover, produces a complete likeness in less time than the artist would require for the merest sketch. In the photographic portrait of manuscript, there is happily no possibility of those copyists' mistakes, those unlucky and misleading errata, which occur—a punishment, it may be, for sins committed in some former state of existence—to the most careful scribe. The serious results which can be caused by the mistake of a single letter are all too well-known. They are of equal importance with those which have notoriously happened in kindred branches of archæologic study. Had the assistance of photography been invoked, the dark Isis with Horus in her lap would not, it may be, have seriously compromised the Christian cult by being venerated as a semblance of the black Virgin and her child, nor, perhaps, would the devout have seen St. John the Baptist borne upwards to the skies in a picture of the apotheosis of the Roman emperor Germanicus.

But the work of the camera is not only convenient, exact, and rapid; it is also comparatively easy, permanent, and cheap. The cost is often inconsiderable as the toil, and difficulties which are sufficient to appal the deftest draughtsman, or the most accomplished engraver, are changed into child's play by the touch of the spear of the solar Ithuriel. Partially effaced texts, which may well fill the bravest paleographist with despair, are, by the camera's co-operation, rendered decipherable. The traces of ink drawn by the ancient writer's patient fingers—fingers resolved ages ago into their component dust—have become yellow, and of one colour with the once fair parchment upon which they are inscribed. The similarity of hue in ink and parchment makes many of the letters inscrutable to any human eye, and much of the meaning sibylline in insignificance. Not Argus, nor Lynceus, with all their far-famed visual energy, could have discovered what the objective displays with the utmost ease, the objective to which artistic license is happily unknown. The aid of chemistry might, indeed, be invoked in the matter of the faded ink, but the means of assistance she offers are as much dreaded by the proprietors of these time-worn relics, and for the same reason, as the Pure Co-operative Washing Powder by the thrifty and astute housewife.

Ancient architectnre with conntry—with its ivy-grown towers, and flowers sprouting from every ruined coign of vantage—or in town rendered esthetic and interesting from its absorption of centuries of London smoke, has ever recommended itself to the artistic photographer—the lover of the picturesque. It is difficnlt for him to pass without casting one longing, lingering glance behind (and without a wish that his camera accompanied him) those quaint old hostelries, with their courtyards fringed with galleries of wood elaborately carved, and darkened by time through the lapse of many generations of such as fonnd their rest therein, before that longer and deeper rest which followed after so surely, and without exception, for them all. Of those quaint inns—which to-day are, and to-morrow their place knows no more—fain would the photographer preserve for himself and for others, if naught else, the outward semblance. Precious will these samples soon become of the building of olden time, memorials of the labour of busy hands long folded to rest, which now meets the eyes day after day of thousands of passers-by, careless of what custom has rendered common, and the dirt of the metropolis unclean. It is said that a society exists for the purpose of photographing such ancient relics. Should there be one, some of the old towns of England might fill the pages of its publications with architectural beauty, and make it—if the quotation be not a little over-worn—"a joy for ever."

By the gatehouse of Lincoln's Inn is the wall upon which, we are told, laboured with his own hands that most illustrious of bricklayers, Benjamin Jonson. "His mother," says Aubrey, "after his father's death married a bricklayer, and it is generally said that he wrought some time with his father-in-law, and particularly on the garden wall of Lincoln's Inn, next to Chancery Lane." This gatehouse was supposed to be in imminent danger of destruction some years ago; but it still survives, adorned with the arms of one Sir Thomas Lovell, who lived in the time of Henry VIII., and of other persons equally noteworthy and unnoted.

In the matter of manuscripts, the photographer will find no lack of material. Among the old papyri existent in our national depository, in the many inscriptions in foreign tongues—Arabic, Chinese, Egyptian, Etruscan, Greek—he cannot complain of a paucity of objects for selection. The writings of antiquity will meet him who cares to search for them both at home and abroad. He may copy the incised slabs in Somersetshire, or the monuments in the cathedral of Hereford. He may carry his camera to the church of Aphrodite in Cyprus, or to the cave temples of Western India. He may take his choice among the ancient epitaphs of the Jews in Naples, or among the cemeteries of Rome; and he may fill the fellows of his particular Society with envy by presenting to them at their annual meeting an inscription of Pompey the Great, or of Tiglath Pileser the Assyrian king.

Of the vast importance of photography in the matter of religious significance dependent upon ancient texts, a sample was quoted in the PHOTOGRAPHIC NEWS some twenty years ago. A London correspondent of the *Western Daily Mercury* happened to know, "as a matter of fact," that a correct though small photograph had been taken of the oldest existing copy of the Athanasian Creed. This photograph was sent direct from the ancient text in St. Mark's Library in Venice to the Record Office in London. The remarkable thing about it is, that the damnatory clauses are not in it. Now, the Athanasian Creed without these damnatory clauses is, if the comparison may be allowed, the play of "Hamlet" without the Ghost. Such a photograph is almost enough to make the good Saint to whom this sacred symbol has been ascribed rise from his grave in holy horror of protestation. But the correspondent of the *Western Daily Mercury* is curiously indifferent. He only expects that this palpable argument will settle the controversy respecting these unlucky clauses. But the clauses are not yet settled; they have, indeed, far too much vitality to be disposed of in so summary a fashion.

It is sad to reflect that the photographing of objects of antiquity has sometimes been a field of scientific warfare; that the history of these pictures has been occasionally polluted by human resentment; and that rival photographers have let their angry passions rise in the portraiture of monuments so far removed from them by the lapse of ages as the Pyramids of Egypt. In 1870, Professor Piazzi Smyth, the Astronomer-Royal for Scotland, published his "Poor Man's Photography," in which he compared his own work with that of the Ordnance Survey Establishment, "subsidised by London wealth, under the orders of Col. Sir Henry James, R.E., F.R.S., Director-General of the Ordnance Survey." Professor Smith, in his entertaining *brochure*, which was dedicated to the Edinburgh Photographic Society, gives, in addition to a list of difficulties in the way of a poor man taking an independent line of research in practical science, his method for single and double negatives, and for single and double positive copying. These innocent plates led in the end to dire results. They led—*via* the "Sacred Cubit"—to Sir Henry James declaring some observations of the Professor to be "sheer nonsense in a comically solemn dress"; and to the Professor declaring that some observations of Sir Henry showed that he "knows nothing of what the religion of Revelation is, or commits a deadly sin."

No human work is, apparently, free from the effects of the primeval curse, certainly not photographic archæology. The reproduction of ancient furniture, for instance, offers its own peculiar difficulties in the commonly dark colour of its ancient wood. To attempt to remedy this inconvenience by an exposure in full sunlight would hardly succeed; the result of such a proceeding has been affirmed on no weak authority to be detestable. We are advised to work in a diffused light, to relieve all sombre spots by reflection, and to redeem, so far as may be, by an exaggerated duration of exposure, the failure of photogenic power. Ancient tapestry will be found to require a full light, though the yellow, faded colours still demand a long exposure. The inscriptions placed on works of art denoting their use or appropriation, or both, commonly known as epigraphs, are sometimes made part of the ornamental detail work upon which they are inscribed. But even when this is not so, reproductions of epigraphs are very frequently the object of cultivated photographic interest. Much facility in copying these, when they are of small extent, is produced by accentuating the cavities of the inscribed letters or signs with black or white chalk, according as the marble or other material on which the legend appears is white or black. But in the many different categories of archæologic photography, experienced practice has suggested rules which will lighten the artist's labour, and bring about all that is desired of ultimate success. It were idle to attempt to give in a single article advice on the multiform requirements arising in the reproduction even of such small objects as jewellery, relics, enamels, dress, tapestry, bronzes, and all kinds of bric-a-brac, for which the full price is given by Mrs. Jacobs (no connection with Mr. Jacobs), of Petticoat Lane. In the portraiture of the larger and more prominent objects of antiquarian interest, on the items of process, exposure, development, lens, plate, camera, tripod stand, varnish, and print, a large series of papers might be written with no small advantage.

## ADDRESS TO THE GRADUATING CLASS OF THE CHAUTAUQUA SCHOOL OF PHOTOGRAPHY.*

This is the age of beautiful pictures. They are everywhere to delight our eyes and gladden our hearts—in books, magazines, newspapers, portfolios, albums, and on the walls of our homes. Photography has done for pictorial illustration what the art of printing did for writing. Each has helped to make beauty, truth, and knowledge of universal interest, and available to all. Daguerre inaugurated the democracy of art, as Guttenberg made possible the republic of letters. Books and pictures once cost so much that wealth alone could purchase them. Now they are the possession of millions. There have been no happier people at this assembly than the men and women, boys and girls, of the camera. How often we have seen your eager faces in these groves or by the lakeside as, under the skilful instruction of your beloved teacher, you have sought, by the touch of the sunbeam, to make "a thing of beauty a joy for ever." Accurate marksmen, you have hit beauty on the wing. A curling wave, the flash of an oar, the smile of a child, or a flying shadow, is not too fleeting for quick embalming in the amber of your negatives.

One thinks with commiseration of that maiden of antiquity, whose affection for her lover, according to ancient tradition, gave rise to the coroplastic art. Wishing to console herself for his absence, she drew his picture with a bit of charcoal while he slept, pencilling the dear face as it was reflected on the wall by a lamp. Oh, for a kodak then! But, it is said, this likeness was so striking that the damsel's father filled in the outline, and thus produced the first medallion.

Children think in pictures. Humanity delights in pictures. The earliest peoples had some rude method of pictorial illustration. The genius of Champollion first unfolded to us the meaning of the pictures found in the hieroglyphic language of the East. Prescott tells us that the reporters of Montezuma gave that monarch, in the beautiful pictorial language of the Aztecs, an exact account of the landing of Cortez.

The present century claims the honour of originating the greatest improvements ever devised in picture-making. We are, however, primarily indebted to the chemist Scheele, who, in 1777, discovered that sunlight would affect certain chemically-prepared surfaces. Wedgwood, in 1802, produced photographs, but neither he nor Sir Humphrey Davy could prevent them from fading. Niepce and Daguerre, two Frenchmen, were the first to accomplish this. Daguerre made known the secret in 1839. His process was, briefly, thus: He exposed to light in a camera a polished surface of silver coated with iodine, then subjected it to the action of vapour of mercury, which was precipitated upon the parts acted upon by the light. Hyposulphite of soda removed all the surplus iodide of silver, and thus made the picture permanent.

Professor J. W. Draper, of New York, was the first in this country to give us photographic portraits. During recent years an astonishing advancement has been made in the applications of this beautiful art. The dry plate and instantaneous impression now give the lover of nature opportunity to secure, not only form and shading, but motion, and have made possible to the amateur what was before attainable by the professional alone.

Photography has become the most important ally of the engraver, and in another department, photo-engraving, borrowing once more from the chemist's knowledge, secures, without the engraver's skill, a result which, at little expense, rivals the best work of a Sartain or a Ritchie. When photography shall make possible the transference of colour by the sunbeam, it will produce pictures the beauty of which will defy the highest skill of the painter, and prove that the sun is indeed the greatest of all artists. When this is accomplished, it will probably be done by a careful application of the law of complementary colours, and a study of the relation of surfaces to the absorption of light.

Investigation now suggests the possible identity of light and electricity, and as the *storage* of electricity is but a question of the near future, who shall say that the dream of the chemist in "Gulliver's Travels" may not be realised with a slight modification? He was trying to extract sunbeams from cucumbers, which were to be placed in phials hermetically sealed and preserved for use in raw, dark, and inclement weather. The photographer armed with dry plates and stored sunshine would, indeed, be well equipped.

In this age of intense application to business and professional work, it is delightful to find a means of relaxation which is, at the same time, promotive of intelligence, health, and happiness. The amateur photographer has rare opportunities for studying the beauties of nature. He may become a close observer, and discriminating in taste. So progressive is his art that he can always be advancing in knowledge and growing more skilful in his work. There is also a delightful *corps d'esprit*, which usually inspires and binds together a great company of persons possessing similar tastes and engaged in like pursuits.

I welcome this graduating class to the goodly fellowship of the Guild of the Sun Worshippers. In conclusion, you will not fail to remember that there are *three* R's in the photographer's vocabulary, and that while *R*adiated light is *R*efracted by our lenses, a very pleasant light may be *R*eflected from our characters. One other hint drawn from the mystic waves of the sunbeam may not be inopportune. The throbbing pulsations of ether are essentially rhythmic, and suggest the hope that you who so fully appreciate the magical order in the vibrations of light, may also enjoy sweetest harmonies in your lives.

J. T. Edwards.

* Delivered at Chautauqua on Photographers' Day.

One of the most frequent questions we have to reply to in the "Correspondence Column" is how to obtain deep black or purple tones on albumenised paper. The majority of amateurs appear to think, notwithstanding that we have often pointed out the contrary, that the tone of the print is entirely dependent upon the composition of the toning bath, whereas it has very little, if anything, to do with the matter. The chief factor in obtaining black tones is the negative, and next, the paper.—*Ex.*

## TAKING THE BABY.

BY F. E. B.

Mrs. Crummey, wife of my old friend, Jack Crummey, is an exceedingly pretty little woman, and it was therefore only natural that, when she asked me to take her baby (she meant, of course, take its portrait), I should respond by saying that I should be delighted. So an appointment was fixed for Saturday afternoon. I forget the sex of the child, but feel sure it was either a boy or a girl. I also forget its age, but I recollect it had no teeth. It might, of course, have had false ones, but if it had it wasn't wearing them.

When I first got to Mrs. Crummey's the child was asleep. This was annoying, because the hour had been fixed under the impression it would be awake, and would have had a bottle of something—I forget what—though I remember thinking that a glass would have been a more suitable quantity for one so young. When they told me the cherub was slumbering, I very innocently suggested waking it up, but Mrs. C. would not hear of it. She said: "The darling would be dreadfully cross, and scream all the afternoon." This startled me so much that I immediately took to creeping about on tip-toe, and talked in hoarse whispers like a stage villain.

I occupied part of the period of waiting in getting my traps together, arranging a background, and so on; but even after this had been done, the infant Crummey slept on. About three o'clock, however, and just as the light had begun to fail a little, a loud wail from somewhere upstairs announced that the young sluggard had roused up, and encouraged me to hope that the time for action had arrived. But I was mistaken; I had reckoned without the bottle, and another half-hour went by while it was being emptied.

And then came the detail of dressing. And what a dress! A nice, clean, starchy little nurse brought the infant down with an inexpressible pride which at first froze me dumb, although I subsequently found courage to protest. The little bald head was crowned with a hat like that attributed to Hamlet's aunt—a thing all plumes and brim; monstrous rosettes hedged in the small visage on either hand, and a dish-shaped bib stuck out under the tiny chin like a preposterous lower jaw. A great white coat of some fluffy material enveloped the unhappy little creature's body, and effectually concealed its shape, while its hands were encased in a species of boxing-glove. It is almost needless to explain that the little thing itself was quite indistinguishable under such a mass of millinery. I pointed this out to the mother as gently as I could, but both she and the nurse took my complaints in very ill-part, and assured me that "everybody else" thought baby looked sweet in this particular costume. Mrs. Crummey, indeed, became, as I thought, a little sarcastic, and, turning to me with her sweetest smile, said, "Do you wish me to take anything off?" I, of course, hastened to explain that I couldn't think of such a thing, and that it was the baby's dress which was too much, and, after she had remarked with great asperity that this was what she meant, we began to pull off some of the darling's swaddlings.

It was an astonishing business. Under the great coat there was a woollen waistcoat with sleeves, under that a white nightgown with an embroidered front, under that a belt of buckram with armholes, under that a small shirt, and then flannel, and then—but life's too short to go right through with that child's garments. I know it was all so extraordinary to me that I began to fear the poor little soul was constructed on the principle of the Japanese puzzle, boxes that lie packed one within another, and dwindle down from a tea chest to an infinitesimal cube. So I again ventured to put in my spoke, and suggested that we had done enough for one day, and might stop at the flannel; but Mrs. Crummey was now bent on rushing to the opposite extreme, and insisted on stripping her offspring of every rag, and flouring it all over like a leg of mutton.

It resisted these outrages stoutly, and uttered piercing cries during their progress, which the nurse obstinately ascribed to wind, even after I had pointed out that there was not a breath of air stirring. Mrs. C., on the other hand, maintained "the precious" thought it was "going out." "Going out!" said I, "why, you surely don't send it into the streets in this condition, do you?" "Oh, really!" said Mrs. Crummey, "you're past everything," and as that was the only answer I could get from her, I left the matter there. When the little victim was absolutely naked, I wanted to begin without further loss of time, but at this juncture both mistress and servant conceived the idea that baby ought to have one sock on and the other lying near it, and that the socks just discarded were unsuited to the purpose, and must give way to a pair which were the gift of grandma. A general hunt thereupon ensued of a somewhat protracted character.

And all this time the light was growing weaker. All things, however, come to him who waits, and at length baby was got into position in the middle of the dining-room table, and besought to look in the direction of the camera. But this it firmly, or rather obstinately, declined to do. I danced in front of it with keys, I laughed, I cried, I clucked, I crowed, I imitated animals, and played the fool with a vivacity that fairly took the nurse by storm. Yet her charge remained obdurate. It buried its face, it stood on its head, it rolled over and over, but look towards the lens it would not. Nay more, it discomfitted me in the middle of an energetic *pas de seul* (executed solely in its interest), by frothing at the mouth, plunging heavily forward, and calling out "madman!" in stentorian tones. The mother and the maid hailed this performance with enthusiasm, and declared the word was "grandma;" but I know better. It said "madman" beyond all question, and what is worse, it wasn't far out, as the sequel will show.

Well, to cut a melancholy story short, let me hurry on to say that, just when I was on the brink of despair, I hit upon the expedient of offering this unmanageable brat the india-rubber bulb and tubing which I use for exposing, and that the inspiration seemed a happy one at the outset.

The young hopeful stopped short in its gyrations, sat perfectly still, and then (under the impression that the articles tendered it formed part of a new and gigantic feeding bottle) broke into an angelic smile, stretched forth a fat, unsteady hand, and muttered "ta." The two women were in ecstacies over this display of intelligence, and we all three stood round while the little demon made slobbery but determined efforts to extract nutriment from the unpromising materials I had given it.

I declare, I had so little suspicion of evil, that if anyone had asked me at that precise moment whether I liked babies, I should have told a lie and said "Yes." And then in the twinkling of an eye the scene changed, for the malignant little beggar, without an instant's warning, gave a yell of savage delight, took a firm grip of the tubing, and, by throwing itself backward with fiendish recklessness, caused my brand new "Acme" to fall over on the fender with a crash that——Well, I'll take two half crowns for the lot, and allow a discount of threepence in the shilling for cash. Mrs. Crummey has been good enough to say I may have another try, but I think not. I think I'll wait till I get a baby of my own, and when I do that you may shoot me.

## VOLATILE PLATINUM COMPOUNDS.*

BY W. PULLINGER, BRACKENBURY SCHOLAR OF BALLIOL COLLEGE, OXFORD.

*Vapour Density Experiments.*—These were at first conducted in a Victor Meyer's tube, in an atmosphere of carbon monoxide. The bottom of the bulb was lined with asbestos. A small block of the compact substance (experiments were made with both substances) was dropped directly from the stopper on to the asbestos.

Experiments were made at various temperatures varying between 200° and 400°. There was, however, no agreement between any of the results. In some cases decomposition was evident, in others the substance was not completely volatilised. Some experiments were made without asbestos, but in no single case, even at a very high temperature, and after the lapse of a considerable time, was volatilisation complete. A final attempt was made with a modified form of apparatus devised by Professor Lothar Meyer. The bulb of the apparatus is constricted in the middle. A small piece of platinum gauze rests on the constricted part; the substance is dropped directly on to the gauze. The vapour formed falls at once into the lower part of the tube, leaving the atmosphere surrounding the solid unsaturated. In this manner the whole of the substance was volatilised; but, on examining the tube, it was found that, even at a temperature of 250°, the vapour of the substance in the bottom part of the tube was decomposed in contact with the glass. The colour of the vapour is a dull red. It seemed evident that the vapour density of the compounds could not be determined when glass vessels were used. Possibly the form of apparatus described above may be useful in determining the vapour densities of other solids with heavy vapours.

It was supposed possible that the corresponding bromine derivatives might be more volatile. An attempt was therefore made to obtain them.

*Preparation of Platinum Dibromide.*—Schützenberger obtained platinum dichloride by passing chlorine over heated platinum sponge. An attempt to obtain the dibromide in the same way failed. V. Meyer and Züblin obtained the tetrabromide by heating platinum sponge with bromine and hydrobromic acid in a sealed tube at 180°, evaporating to dryness, and heating to 180°. It is not necessary, however, to make use of sealed tubes. If platinum sponge be simply boiled for a short time with an excess of bromine and hydrobromic acid, in a flask connected with a reflux condenser, the whole is dissolved. If the solution is then evaporated to dryness and the residue heated, bromine and hydrogen bromide are evolved. According to Topsoë, this takes place slowly at 100°, but more quickly at 200°, leaving a bright brown powder which, when washed to free it from undecomposed tetrabromide, gives a brownish-green residue of the dibromide. It is, however, very doubtful whether any dibromide is formed at the lower temperature. The residue, obtained as above, was heated in an air-bath. Some dibromide was formed at 180°. This, when thoroughly washed from the tetrabromide, had not a brownish-green colour, but was coal-black. After heating another portion at 255° for five hours, some undecomposed tetrabromide still remained, but this time the colour of the dibromide was a dark, clear brown. It would seem, therefore, that the colour of the product is conditioned by the temperature of its formation. A third portion was heated at 310° for four hours in a current of air. Even at this temperature a residue of tetrabromide was left. The most convenient temperature for the preparation of the dibromide was found to be about 280°.

It may be here mentioned that spongy platinum is also dissolved by a hot solution of iodine in hydriodic acid, yielding a dark red liquid. From this the tetraiodide can be easily obtained by evaporating it to dryness, heating the residue to 180° in an air-bath, and washing away the soluble part. The iodide thus obtained is a compound of singular stability, seeing that it can be heated with sodium carbonate to the fusing point of that salt without losing all its iodine. A rough determination of the platinum in the iodide was made by reduction with magnesium and acetic acid; this gave a percentage of 28·2 of platinum, against the theoretical 27·7.

*Action of Carbon Monoxide on Platinum Dibromide.*—The dibromide was contained in a small boat which was placed in a combustion tube. The end of the tube was bent into a U-shape, so as to serve as a receiver for the volatile compound. The straight part of the tube was placed in a combustion furnace, which was gradually heated; in the meantime, a slow current of dry carbon monoxide was passed over the dibromide. At the cool end of the tube a sublimate was formed, consisting of yellow and white crystals, and a brick-red powder. At about 180° the contents of the boat melted, giving a dark red liquid which was volatilised with difficulty; so great was the difficulty of completely volatilising this liquid, that it seemed impracticable to determine its vapour density. The sublimed substance was now melted by immersing the U-tube in a heated paraffin bath. A current of carbon monoxide was passed over the melted substance for more than an hour, in order that a maximum amount might be absorbed. From the analogy to the chlorine compounds, it was supposed that a compound $PtBr_2,2CO$ would be formed. Such, however, was not the case. On cooling, the substance solidified to a mass of bright red needles. The platinum and bromine in this compound were estimated by heating a weighed quantity in a platinum crucible with a very large excess of carbonate of soda. That none of the substance was volatilised was evident from examination of the crucible after ignition. The resulting platinum was washed and weighed, and the bromine in the washings was estimated in the usual way. In this and in many other analyses the carbonate of soda was tinged a darkish blue. This may have been due to the formation of a sub-bromide of sodium, corresponding to the subchloride of potassium described by Bunsen (*Ann. Phys. Chem.*, 1861, 113, 445).

The following results were obtained :—

| | | | |
|---|---|---|---|
| Percentage of platinum, | 50·44 | 50·33 ; | mean, 50·38 |
| ,, bromine, | 41·504 | 1·03 ; | ,, 41·26 |
| ,, CO, | 8·06 | 8·67 ; | ,, 8·36 |

This approximates closely enough to the constitution of a compound having the formula $PtBr_2,CO$, which has the following percentage composition: platinum, 50·90; bromine, 41·79; CO, 7·31. It would appear, therefore, that this compound, which may be called "carbonyl-

* Concluded from page 659.

bromoplatinite," does not absorb carbon monoxide at its melting point.

*Properties of Carbonylbromoplatinite.*—The melting points of two different specimens were taken with a delicate thermometer, with the following results: (1) 177·5°, (2) 177·5°, (3) 178°, (4) 178°. Mean result, 177·7°. It is bright red, and crystallises in well-defined needles. It is much less sensitive to the action of moisture than the corresponding chlorine compound; indeed, it may be exposed to the air for a considerable time without darkening in colour. When treated with water, it first dissolves, giving a red solution, which, however, almost instantly blackens. The black product is soluble in hydrobromic acid. Absolute alcohol dissolves the substance without blackening, giving a dark brown solution. When melted in a stream of carbon dioxide, it loses carbon monoxide, and appears to be converted into the dibromide of platinum.

In conclusion, I must express my very sincere thanks to Professor Lothar Meyer for the great assistance which he has given me. It was he who suggested the work, and he who, during its progress, aided me with very many suggestions and much personal help.—*Journal of the Chemical Society.*

## AMERICAN OPINION CONCERNING THE RECENT CONVENTION MEETING AT BATH.

We have seen, says the (Chicago) *Eye*, a copy of the group taken of the members of the last convention of British photographers, which was published in the last number of *Photography*. They all appear to be a most intelligent class of men, and are representative men of the profession, but there certainly was not a very large attendance. British city officials attach more importance to a meeting of photographers than city officials in this country do, as at Bath, England, a formal reception took place under the auspices of the Mayor of Bath. The Mayor, in welcoming the Convention, made quite a long address, which is in striking contrast to the concentrated address by the Mayor of Boston two years ago to the P. A. of A.

The Mayor of the Hub bowed his congratulations without saying a single word, and left. The Mayor of Bath said he was old enough to remember the introduction of photography. He could call to mind the first dawning of their beautiful science. He could look back upon the wonder and pleasure which spread from town to town and from country to country when its beneficent power gradually became known. He had observed through half a century its wonderful progress all over the world, increasing incalculably human enjoyment, intellectual expansion, solid, practical, substantial good; therefore he could not fail to welcome most cordially those who were associated for its promotion.

Chemical Effects of Light—Measurement of Physical Absorption.—The experiments were made with a solution of ferric chloride and oxalic acid, the quantity of ferrous salt formed being estimated. One cell containing this solution was exposed directly to light, whilst a similar cell was exposed behind the medium the absorption of which was under investigation. In the case of ferric chloride, the absorption varies somewhat with the state of the atmosphere, but under favourable conditions the variations are not great, and the results may be represented by the following expression, which is calculated for semi-normal ferric chloride, $i$ being the intensity of the transmitted light, and $l$ the thickness of the absorbing layer: $i = 0{\cdot}01\ (0986)^l + 0{\cdot}07\ (0{\cdot}40)^l + 0{\cdot}13\ (0{\cdot}10)^l + 0{\cdot}79\ (10^{-10})^l$. — *Journal of the Chemical Society.*

## PHOTOGRAPHIC CHEMISTRY.*

BY PROFESSOR R. MELDOLA, F.R.S.

The photo-chemical studies which have been dwelt upon lead up to the consideration of the silver compounds, which must, of course, receive special treatment on account of their present importance in photographic processes. At the outset, it is desirable to point out that our knowledge respecting the action of light on the silver compounds is in a different position to that concerning the simpler cases of photo-chemical decomposition which have hitherto been discussed. In the latter the chemical change is definite enough to be represented by ordinary equations, the composition of the final product being in most instances known. In the case of the silver salts, we possess no such accurate knowledge, and the nature of the products is still surrounded by mystery.

When light falls on the silver haloids chemical decomposition takes place, accompanied by a change in colour. In order that this statement may be properly realised, let it be shown that there really is decomposition, and that the chloride and bromide under these circumstances give off a gas which blues starch and potassium iodide paper. The iodide does not undergo decomposition on exposure except in the presence of an iodine absorbent, *i.e.*, a sensitiser. Passing on to the action of light on films of the haloids, it is possible, by means of a few simple experiments, to demonstrate many important properties of these compounds with which the student should be familiar. For this purpose sheets of paper, well coated with the pure haloids free from excess of silver nitrate, and a few ordinary reagents, are the only requisites. By one operation it can be shown that, with the same exposure, the chloride becomes darker than the bromide and the latter darker than the iodide, and at the same time that reducing agents and halogen absorbents accelerate, while oxidising agents retard, the decomposition. Thus, three strips coated respectively with the three haloids may be painted with stripes of solutions of (1) sodium nitrate, (2) sodium sulphite, (3) silver nitrate, (4) mercuric nitrate, (5) potassium dichromate. After exposing these strips simultaneously to the action of light, the stripes 1 and 2 will be darker than the ground-colour, showing the accelerating action of the reducing agents; 3 will also be darker than the ground-colour, showing that a halogen absorbent may also act as an accelerator without necessarily being a reducing agent; while 4 and 5 will retain the original colour of the haloid, showing the retarding action of oxidising agents. A comparison of the ground-colour in the three strips will also serve to show the different colours of the products of photo-chemical decomposition.

Such demonstrations as these cannot fail to impress the mind that the action of light on the silver haloids is a distinct case of photo-chemical decomposition, but it is necessary at this stage to issue a caution. The action is in these cases continued up to the point of visible darkening, whereas in the photographic film the exposure is so short that no directly visible effect is produced. It must be enforced, therefore, that in associating the photographic image with these darkened products, we are drawing largely upon arguments from analogy. The point that will now present itself is the actual composition of the darkened products, and here it may at once be pointed out to the student that our knowledge respecting these compounds is in precisely the same state as that concerning the coloured haloids dealt with. In the case of the darkened chloride, it has been proved that this product contains a little less chlorine than the normal chloride. In all three haloids, no matter how long the exposure may be, the final product always contains an enormous excess of unaltered haloid. It may safely be asserted that these products are not chemical compounds in the ordinary acceptation of the term, since they are not composed of the haloid combined with the coloured product of photo-chemical decomposition in definite molecular proportions. Neither can the "photo-salts" be classed with the definite "molecular compounds" of modern chemistry, since the latter also consist of substances combined in definite molecular proportions, and can be more or less readily resolved

* Continued from page 662.

into their constituent molecules by appropriate treatment. But the "photo-salt" cannot be resolved by any such treatment, since all solvents which dissolve the normal haloid appear to decompose the darkened product, leaving only a trace of metallic silver. On the other hand, metallic silver cannot be extracted from the "photo-salt" by any of the ordinary methods.

In answer to the question which the inquiring student would naturally put, "what is the photo-salt?" it can only be said that these products must be regarded as indefinite molecular compounds of the silver haloids with coloured unstable products of photo-chemical decomposition, the composition of the latter being as yet unknown. That the coloured products are unstable appears from the fact that they cannot exist apart from an excess of the normal haloid. In the same way that a solvent will take up a solid till the point of saturation is reached, so the silver haloid, on exposure to light, becomes decomposed up to a certain point—*i.e.*, the point when the haloid is saturated with the coloured product of photo-decomposition. Beyond this point the action of light produces no further effect unless a reducing agent is present capable of combining with the liberated halogen as fast as the latter is liberated. It is advisable to let the student observe for himself that silver iodide prepared with excess of potassium iodide undergoes no change of colour on exposure to light, but that in the presence of silver nitrate or reducing agents, darkening occurs. Let him observe also that the darkened chloride yields no appreciable quantity of silver to dilute nitric acid, but that in the presence of a strong reducing agent, even when the latter is gaseous, such as hydrogen, the reduction may proceed up to the complete liberation of the metallic silver. This last point can be demonstrated very conveniently by placing some finely-divided silver chloride (prepared by precipitation) into a glass tube through which a current of moist hydrogen is kept passing, the gas being made to bubble through a solution of silver nitrate containing free nitric acid. On exposing the contents of the tube for some time to strong light, silver chloride is precipitated from the solution of the nitrate, the chloride in the tube (which should be shaken from time to time in order to expose fresh portions) gradually becoming dark coloured. An equal quantity of the chloride may be exposed in air at the same time for comparison. The two lots of darkened chloride are then treated with equal quantities of dilute nitric acid, the clear solution filtered off, and the filtrates tested for silver. If the experiment has been properly conducted, the solution from the chloride darkened in hydrogen will be found to contain distinct traces, while that from the chloride darkened in air will be free from silver.

Having arrived at the conclusion that the silver haloids, when exposed to light under suitable conditions, lose a small quantity of their halogen, and become converted into coloured compounds, the course of instruction will here naturally diverge along two lines :—

(1) The nature of the coloured product combined with the excess of unaltered haloid ; and—

(2) The part played by the associated substance or sensitiser.

With regard to the first, it must be pointed out that, although we have no positive information of a conclusive character, many views have been advanced which are more or less worthy of consideration ; and an excellent exercise in the use of scientific judgment might be given to the advanced student by submitting the current notions respecting the composition of these products, and requesting him to prepare a critical essay embodying his own views.

(*To be continued.*)

Richmond Camera Club.—At the meeting on the 18th inst., a proposal to admit ladies to membership on certain conditions was adopted, subject to the approval of the forthcoming annual meeting ; and a circulating library was started.

London and Provincial Photographic Association.—October 1st, "A Perfect Emulsion by a New Method" ; demonstrated by Mr. A. L. Henderson ; visitors invited. October 3rd, final outing of the season to Hampstead, in place of September 26th ; tea at "Bull and Bush," 6.30.

# Patent Intelligence.

## Applications for Letters Patent.

15,544. Alfred Morgan Gilliam, Oak Lodge, Wellington Road, Wanstead, "Improvements in and in Connection with Cameras."—*September 14th.*

15,553. George Wilson Morgan, 30, Gladstone Place, Aberdeen, "Improved Movable Graduated Backgrounds for Portrait Photography."—*September 14th.*

15,615. William Phillips Thompson, 6, Lord Street, Liverpool, "Improvements relating to Photographic Apparatus or Devices for Automatically Registering and Indicating the Number of Exposures." (Ellis Elmer Moore, United States.) —*September 15th.*

15,657. Fox Shew and Lorenzo Henry, 23, Southampton Buildings, London, "Improvements in Photographic Cameras."—*September 15th.*

15,700. Rose Mary Shawcross, 15, Water Street, Liverpool, "Improvements in and Connected with Sensitised Surfaced Paper, Woven or Tissue Fabrics, or other Material for the Production of Copies of Drawings, Designs, Pictures, Photographs, Writings, and the like, by the Action of Light."—*September 16th.*

15,861. Thomas Rudolph Dallmeyer, 24, Southampton Buildings, London, "Improvements in Photographic and Telescopic Apparatus."—*September 18th.*

15,908. William Alfred Smith, 186, Fleet Street, London, "An Improved Photographic Shutter."—*September 19th.*

## Specifications Published.

5,860. *April 17th*, 1890.—"Detective Cameras and Change-Boxes." H. Ransom, 122, Newington Butts, London.

The sensitised plates are placed in clip sheaths or backings, which are hinged to a cylinder within the camera. By rotating the cylinder from the outside, the plates are brought in succession to the focus, being there held between flexible guards and a stop. The cylinder is also arrested at this stage by a spring pawl, which engages a ratchet on the cylinder. The pawl is disengaged by a rod. The indicator numbers on the end of the cylinder are observed in succession through an aperture in the camera. In a modification a segment of a cylinder replaces the cylinder. A disc shutter actuated by band gearing is described.

6,028. *April 21st*, 1890.—"Lenses." P. Rudolph, Jena, Saxe-Weimar, Germany.

The principal object in these lenses is to remove the indistinctness of the marginal portions of the field. They consist mainly of dissymmetrical combinations of lenses, composed of two distinct systems of lenses cemented together. In one of the two distinct systems the positive number (the collecting lens) has a smaller, in the other system a greater, refractive index than the negative number (the dispersing lens) cemented thereto, and each system is in itself approximately achromatic. In one form of the lens the front combination is composed of a dispersing lens and a collecting lens, while the back combination is made up of a collecting lens and a dispersing lens. Tables giving the radii of curvature of the different lenses, and the refractive indices and relative dispersive power of the different kinds of glass to be used, are given in the specification. In another form of the lens the back combination consists of three lenses cemented together.

6,029. *April 21st*, 1890. — "Lenses." E. Abbe and P. Rudolph, Jena, Saxe-Weimar, Germany.

The combination consists of two single collecting lenses and a compound system consisting of three lenses cemented together, for correcting the spherical and chromatic aberration of the lens without perceptibly altering its focal length. Tables are given showing the radii of curvature of the lenses, and the refractive indices, and dispersive power of the glass to be used in particular cases.

Photographic Club.—Subject for Sept. 30th, "Mounting and Framing"; Oct. 7th, "The Influence of Development on the Colour of the Deposit." Last outing of the season, Saturday, October 3rd, Hampstead ; tea at "Bull and Bush" at 6.

## Proceedings of Societies.

Midland Camera Club.

A provisional committee meeting was held on Friday night last; Dr. Hall Edwards occupied the chair. It was reported that the club rooms were being arranged for, as also the furniture and fittings. The draft rules were discussed and adopted. Mr. J. Trout and Rev. J. Henry were added to the provisional committee. A prospectus stating the objects aud advantages of the club is to be drawn up and circulated throughout the district. The objects of the club, according to the adopted rules, are: "The advancemeut of photography in all its branches, and the promotion of social intercourse amongst all photographers. First, by the holding of periodical meetings for lectures, papers, discussions, and practical demonstrations; and by friendly competitions upon photographic subjects. Second, by the provision of convenient club rooms, with dark room, &c., for the use of members. Third, by the promotiou of intercourse between this aud other societies." The membership is to be quite open to both amateurs and professionals, ladies as well as gentlemen. The subscription has been fixed at 10s. per annum, youths uuder eighteen, who would benefit by the "beginners' section," 5s. per annum. General meetings are to be held on the first and third Fridays in each month, and the sectioual meetiugs as arrauged by each section, and where they choose. The first general meeting will be held on the third Friday in October (16th), at which the officers and committee for the ensuing year will be elected. Applications for membership and other details to be obtained from the prov. hon. sec., 47, Hagley Road, Birmingham.

Leeds Photographic Society.

On Monday evening last, Mr. G. H. Rodwell gave the sixth of the series of elementary lectures, his subject being "Lantern Slide and Transparency Making." Mr. Rodwell said that for lantern slide work the wet-collodion process was by many considered the finest; for fiueness of deposit and transparency in the deepest shadows it was hard to beat, but this could only be said when in the hands of experienced workers. With the average amateur, the extraordinary care necessary rendered it a difficult process to work. The gelatino-bromide process was much more suitable, and, with ordinary care, fine results could be obtained. Mr. Rodwell advocated a slow plate on which to make transparencies; as a rule, the slower the plate, the warmer would be the tone of the resulting slide. Having explained the method of printing by contact, and also by reduction in the camera, Mr. Rodwell dealt with the various methods of development, and explained his method of obtaiuing warm tones. For this purpose pyrogallic acid development was the best, aud the following was his formula:—

| | |
|---|---|
| Liquor ammonia (fort.) ... ... ... | 1 drachm |
| Ammonium bromide ... ... ... | 1 ,, |
| Water ... ... ... ... ... | 20 ounces |

For developing, add one graiu of dry pyrogallic acid to one ounce of the above just before using. He did not advise any alteration in the developer, but rather alter the exposure to suit the developer. Should the slide not be of the required tone or density, it was almost useless to try and alter it, and it was far better to make another slide. Intensification was also unsatisfactory. It was, however, possible to reduce an over-dense slide by means of Howard Farmer's ferricyanide formula, and this was specially useful in clearing skies by local reduction, using a camel-hair brush to wash the reducer over the sky. At the conclusion of his remarks, Mr. Rodwell exhibited a number of fine slides.

To Engrave on Glass.—The *Sprechsaal* recommends the following receipt for engraving inscriptions on glass bottles, &c.:—Dissolve in about ½ a litre of water 36 grammes of fluoride of sodium with 7 grammes of sulphate of potash; in another vessel, mix 14 grammes of chloride of zinc and 65 grammes of hydrochloric acid in ½ a litre of water. Mix the two solutions, and apply with a pen or brush; at the end of half-an-hour the inscription appears.

## Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C S., 2, St. Mary's Road, Canonbury, N.**

H. K. (Brighton.)—*Pink Silver Print.* We are at a loss to account for the strongly pronounced colour of your print. Is it the only one of the batch which exhibits this defect; or was red blotting-paper used in this instance to soak up the moisture? Your letter is hardly specific enough, only that the process therein detailed ought *not* to give this result. The fumes of aniline will, we know, quickly redden some kinds of paper by determining the formation of rosaniline; or it may happen that some of the dye washed out of the rose-tinted albumenised paper and became concentrated in the last bath.

Painter.—*Instruction in Colouring.* You cau get your portraits enlarged directly upon canvas by the Autotype Company, and then work upon them in oils according to your usual practice. Mr. A. H. Bool's little book on "Photographic Painting" may give you a few hints, but your art training ought to be relied upon as worth more than all the advice we can give.

C. R. and Co.—*Patents.* We find it impossible to complete our search and quote the numbers this week, but will do so as soon as possible, and let you know by letter.

Films.—*Reduction of Over-Developed Negatives.* By the cautious use of very weak cyanide it might be possible to reduce those that appear to be too dense. Try this, at any rate, before resorting to chloride of lime or iodine tinctures, which have to be followed up with a fresh fixing treatmeut. Red prussiate is often found useful for the same purpose. See formulæ at the end of the Year-Book.

Aberdeen.—*Platinotype Details.* You will find all the information given in Mr. Willis's successive communications to the Photographic Society, also iu Captain Abney's "Instruction in Photography" (Londou: Piper and Carter). You may even consult with advantage "Fallowfield's Annual," where a very good general account of the hot and cold processes is to be found. Give the *former* method a fair trial in the first instance.

L. E. D.—*Obernetter Prints.* Never attempt to dry them by suspension on a clip, for they are almost sure to turn inwards and stick together hopelessly. Either squeegee them down on plates of glass rubbed with a little French chalk spread on a wash-leather pad, or upon similarly-prepared squares of celluloid, in which latter case the prints will not have quite so lustrous a surface. If a rougher grain is desired, use ground glass lightly coated with vaseline.

M. T. (Plymouth).—*Brackish Water.* Short of distillation, there is no method of purifying water containing much sea-salt. The best plan would be to wash your prints and negatives first with the brackish water until all the hypo is removed, and then finish off with distilled or filtered rain water.

W. H. B.—*Pall Mall Lantern Exhibitions.* The pink tickets will admit either in the morning or evening, with Thursday in addition to the programme of last year. The white tickets are ouly available in the daytime, that is, between the hours of 10 a.m. and 5 p.m., from Sept. 28th to Nov. 12th.

Cambs.—*Focussing Hood.* It is a good plan to make the black cloth fit loosely upou the camera, with aperture to slip over the lens. The slide should be manipulated, and carrier opened, whilst protected by the black bag, which should then be twisted round and stowed away beneath the tripod head of the camera stand. Always avoid leaving anything loose at the moment of exposure to flap about in the wind. A short leather strap is a useful addendum to the outfit.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1726.—*October* 2, 1891.



CONTENTS.



## REVERSED NEGATIVES.

Nearly all the photo-mechanical processes at present in use require that the negatives from which the plates or blocks are produced shall be reversed. Take the case of the most simple of all these processes, the well-known method of producing blocks from line drawings which is employed for the illustration of so many periodicals. The original drawing is reproduced line for line just as it came from the artist's pen, and the first operation in the reproductive process is to obtain from it a reversed negative. This is almost universally done by fitting the hood of the lens employed with a mirror, so that during the process of copying the original drawing faces the side of the camera. Such a method of procedure, associated with an electric arc lamp, is perhaps the most convenient and perfect manner of obtaining a reversed negative. But it entails the use of extensive plant, which only those who devote themselves to this class of work can command. The every-day photographer cannot hope to compete with such workers, but he may be often so placed that a reversed negative is required quickly, and he has to depend upon his own resources to produce it. What is the best way of setting about the work?

The simplest method of all is undoubtedly the use of a celluloid film for the original negative, for both sides of it can be printed from, one side obviously giving a reversed image. But films are not in common use for studio work, nor are they likely to be used by professional hands, for their chief advantages, lightness and reduction of bulk, disappear when the operator is at home in his own quarters. Certainly, there is the further advantage of freedom from breakage to be considered, but this almost disappears in studio work, for the hand becomes so accustomed to deal with the fragile glass that a plate is as seldom broken as an egg is by the mother hen. Besides, films are much more costly than glass, and require greater care in development, and these facts, added to the other difficulties which we have enumerated, make the professional photographer still dependent upon glass plates for his every-day work.

Many a satisfactory reversed negative has been made by the simple expedient of putting the dry plate in the dark slide with its sensitive surface turned away from the lens, and this is the plan which we should recommend when only an occasional negative of this kind is required. But to attain the best results several little precautions are necessary, and non-observance of one of them may utterly ruin an otherwise perfect picture. To begin with, the plate must be carefully cleaned on the glass side, so as to get rid of those patches of stray emulsion which seem to be so dear to the average plate-maker, and which form an admirable example of "matter in the wrong place." This is a risky thing to do in the limited light of the dark room, but perhaps the best means to employ for the removal of the obnoxious gelatine is a damp sponge which is just dipped in fine pumice powder. It is best only because it is quick, and the quicker such an operation is, the better. Next, the thickness of the glass must be measured with a pair of callipers or compasses, another plan being to take a hasty impression of the edge of the plate with a piece of wax or tinfoil. The object of this measurement is to gauge the exact distance which the plate must be moved from the lens after the image is focussed, for, unless the thickness of the glass be thus allowed for, the picture must of necessity be blurred. One more little matter has to be attended to. The spring at the back of the dark slide must be prevented from scratching or pressing unduly upon the sensitive film, and perhaps the best way to prevent this is to back up the plate with a velvet-covered card. The exposure need not be more than the normal, for the thickness of glass through which the light has to travel before it reaches the film does not make any appreciable difference.

So far, provided that the matters to which we have called attention are seen to, all is plain sailing, and success is within reach. It is the development which will try the operator's skill. Not that any particular precautions are necessary here, but because the appearance of the plate during development is different to that to which he is accustomed. Let us remember that the alteration caused by the access of light to the film has affected the side next the glass, and not the side which lies upwards in the developing dish; so that the chemicals have to permeate a layer of gelatine which has hardly been affected at all by the exposure before they can get at the altered silver, and make the image visible. There is thus unusual delay in the image "coming up," and when development is actually far advanced, the operator is apt to think that it has hardly begun, for he sees it through a semi-opaque film of unaltered gelatine. He must therefore be careful to hold the plate often up to the red light, for it is only in this way that he can judge of the growing density of the deposit. Perhaps it would be well to develop all such plates in a dish with a glass bottom, through which progress can be easily seen without removal of the plate.

If the photographer is accustomed to transparency-making, he may prefer, to the method which we have recommended, the plan of making a positive on glass from the original negative, and copying that positive, with its film turned away from the camera, in order to get the reversal. This plan entails far more trouble than the other, and the negative ultimately produced is generally not nearly so good; for, as everyone knows, in this tiresome process of getting positive from negative and negative from positive again, there is always a loss of pluck and a flattening of the image which is most destructive of its beauty. One can hardly say how and what it has lost; but there is a distinct deterioration all the same, and of course the fault is not remedied in the ultimate photo-mechanical print for which the reversed negative was undertaken.

We have not said anything about stripping films from the glass, for in the case of dry plates this is generally a risky proceeding. If anyone wishes to try that method, let him by all means experiment with some spoiled plates of the same make before he plays any tricks with a valued negative. Many excellent methods of doing this work have been published, and we need here only refer to that fact. The best results from stripping are gained from employing the wet collodion process, for the film in this case is so tough, and free from any tendency to contract or expand, that it can be floated off one glass and attached to another without much difficulty, provided that the operator has a steady hand and clever fingers. Of course such a film ought to be coated with india-rubber solution and plain collodion before it is removed; but the manipulations are all described in the text-books, and need not be repeated here. It is doubtful, too, whether any dry plate worker will care to plunge into the many difficulties which must assail a tyro with the silver bath.

Richmond Camera Club.—On the 25th ult. the subject discussed was the eikonogen and hydrokinone developer. All present who had used the combined developer testified to its merits in case of snap-shots and under-exposed plates.

## SPHERICAL ABERRATION AND THE FOCAL PLANE.

BY W. E. DEBENHAM.

In an article on "Spherical Aberration" in your issue of the 18th ult., Mr. T. R. Dallmeyer speaks of the "absurdity" of placing the focus midway in the locus of aberration, as done by Mr. W. K. Burton. He further gives, as a positive statement, his own view that the apex of the axial cone "is the position of greatest concentration theoretically and practically, and is the best focus, unmistakable to the practised eye." It will, I think, not be difficult to prove, even to those who have not made a special study of photographic optics, that Mr. Burton is right beyond question in taking the position of best focus, as was done by the late Mr. Thos. Grubb, somewhere between that of the axial and the marginal rays; and therefore, that if there is any "absurdity" in putting forward a mistaken view on the subject, Mr. Dallmeyer must be content to accept the position in which he would place his adversary.

If, as Mr. Dallmeyer says, the best focus is at the apex of the axial cone, then, as that position is fixed, and does not vary, however large may be the opening used, the change of diaphragm from large to small or *vice versa* would not, in the case of a lens having spherical aberration, affect the position of the focus any more than it does with a perfectly corrected aplanatic lens. Those who have worked with lenses having marked spherical aberration know very well that the insertion of a diaphragm *does* alter the position of the focal plane, focus being lengthened and brought more nearly to the place of focus of the axial ray in proportion as a smaller diaphragm is used, whilst with a larger aperture, or one sufficient to show more decidedly the existence of the spherical aberration, the focus becomes shorter; being, in short, a position, as stated by Mr. Burton, which is intermediate between the foci of the marginal and central rays.

The fact of the shifting of the focal plane by the insertion of a diaphragm in a lens having spherical aberration, is one so well known to photographers who practised when lenses of that character were more in use than at the present time, that it seems strange that Mr. Dallmeyer should make a statement involving the negation of that fact. The American optician, Zentmayer, in the "sixties," constructed a lens the use of which depended upon the existence of this change of the position of the focus. The lens was made of one kind of glass only, and was not achromatised, in spite of which facts it was issued as working true to focus. This was accomplished by directing the operator to focus with the large aperture, and then, before exposure, to insert a small diaphragm of a definite relation of aperture. By this means the focus of the lens was lengthened just as much as was required to correct the chromatic aberration. If the focus had been as Mr. Dallmeyer's proposition requires, always at the apex of the axial cone, the insertion of the stop would have made no difference to its position, and the lens would not have worked to focus.

The reference to the practice of astronomers with regard to spherical aberration is quite beside the question. It has been already pointed out that, with an intensely luminous point, such as a star against a dark ground, there may remain light enough to form a visible image when the marginal rays are dispersed and only a small portion of the objective at the centre is actually forming the attenuated image, whilst with subjects such as photographers have to deal with the case is quite different.

Mr. Dallmeyer refers to his paper read at the Camera Club Conference last year, and the illustrations accompanying it. I have already pointed out—the second time at the last Camera Club Conference*—that figures in those illustrations said to be taken with the lens removed certain distances from the best focus, are actually in better focus than those stated to be taken at the best focus. One might think that Mr. Dallmeyer would do well to accept Mr. Burton's suggestion—that with much spherical aberration personal equation has an opportuuity for steppiug in, and that ouc may suppose the focus to be almost anywhere desired—instead of rejecting and denouncing his suggestion as want of practice.

With regard to the question as to whether there is any gain in definition in the out-of-focus planes by introducing spherical aberration, as claimed by Mr. J. H. Dallmeyer, it may be observed that he never attempted to refute Mr. T. Grubb's demonstration to the contrary, which, one may reasonably suppose, would have been done if it had been possible, either theoretically or practically. Mr. T. R. Dallmeyer has reduced the claim to one scarcely worth discussion wheu he said that the definition became better on one side of the best focus, but worse on the other. If the claim for improvement, at any part, depends upon such statements and illustrations as have been dealt with, it may as well follow the original claim for better definition in the out-of-focus planes.

* Photographic News, page 281.

## METHOD OF REDUCING THE INTENSITY OF NEGATIVES.

BY P. C. DUCHOCHOIS.

The *clichés* may be too intense, either from yellow fog, over-development, or local opacities. We have nothing to say on the means employed to remove yellow fog; they do not alter the character of the picture, nor on those which attenuate the contrasts or local opacities, which, if done by re-development, answer pretty well; but we think that the reduction of *clichés*, generally too inteuse, is effected by chemical actions which are often objectionable. Among the processes employed for the purpose in question, the old one, that which we first employed, both iu the calotype and the collodion process, consists in treating the *cliché* with a solution of potassium cyanide. It is the best, on account of its simplicity, and of not requiring much after-washing. The drawback in the gelatine process is that the solution of the commercial article, KCy, has, on account of its strong alkalinity, a tendency to produce blisters and frilling by softening the film. This can, however, be easily prevented by using pure potassium cyanide in solution in alcoholised water. The next process in order of publication is that devised by Alexis Gaudin. The reduction is effected by ferric sulphate (Monsel's salt). This process requires to eliminate the iron salt by first washing the gelatine film in a diluted solution of hydrochloric, citric, or oxalic acid, &c. It is little employed. Then come Spiller's process, which consists in treating the *cliché* by a solution of cupric bromide and common salt; that of Farmer, who uses potassium ferricyanide in solution with sodium thiosulphate; and lastly, Monckhoven's process, by which the reduction is effected in attacking the silver with ferric oxalate, the silver salt formed being dissolved by sodium thiosulphate, as in Farmer's process. The latter processes—those of Farmer and Monckhoven—require prolonged after-washings to eliminate the thiosulphate. For this reasou, the process of Mr. Johu Spiller is preferable, as the solvent of the cuprous and silver bromides is simply common salt, an entirely harmless compound, should any traces of it be left in the film.

As it is seen, in all these processes *the intensity is reduced by dissolving the metallic silver forming the image.* If employed for the reduction of *clichés* generally too intense from over-development, the relative value of the local intensities may be little altered, provided the operatiou be couducted with great care; otherwise—and, indeed, this is of frequent occurrence—it happens that the penumbras and the details in the shadows, being formed by thin layers of metallic silver, are dissolved, and, as a consequence, that the *cliché*, if not spoiled past remedy, has lost that admirable gradation from lights to shades, that delicacy of details, which makes a photograph such a beautifully realistic image of nature.

A rational process would be to reduce the intensity, uot by dissolving the silver, but by transforming the colour of the image into one more actinic, or rendering the *cliché* more transparent, so that not only the desired de-intensification would result, but, if the intensity were too much reduced, it would always be possible to streugthen it.

For example, the *cliché* previously soaked iu water is immersed in a very diluted solution of nitro-bromhydric acid or of nitro-chlorhydric acid (aqua regia). In the solution the image, viewed by transparency, seems to intensify on account of the formatiou of the silver bromide (or chloride), but when exposed to sunshine for a certain period, it becomes more trauspareut from the reduction of the silver haloid, and turns to a bluish or violet-black, that is, a more actinic colour than the original oue. The operation should be conducted by diffused light, and the *cliché* allowed to dry before exposure to the luminous action, for, if dried in the light, the silver reduction would be of unequal intensity, the parts drying first being the lightest. In fact, when exposed under water, or better, in presence of an absorbent of chlorine or bromine, the reduction is more complete and darker, which is generally advantageous. Of course, the de-intensification is proportiouate to the more or less complete trausformation of the metallic silver (the image) into silver haloid; and it is in this where resides the difficulty of the process; it requires some experieuce to succeed. There is, however, little danger of spoiling the *cliché*, for should it be too much weakened from being bleached through, the remedy is at hand. It suffices, *after the insolation*, to redevelop with a very weak developer—pyrogallol, eikonogen, &c.—or to intensify with mercuric chloride, or by any other intensifying processes. No fixing is required after these operations; it is only necessary to well wash the *cliché*.

We have also experimented with iodohydric acid, and, iu lieu, with iodine, but the results were not generally as good. The silver iodide does not blackeu iu the light, and remains apparently uot acted on, and when treated by the developer gives rise to a great increase of intensity. This can be regulated during the redevelopment, and an after-treatment with a solvent of silver iodide, sodium thiosulphate, &c. The iodide process has given us satisfactory results for the intensification of very weak negatives. As said above, the redevelopment should be done after iusolation, and with diluted developers, in order to have the action well under control.—*Photo. Times.*

The appointment of "Opticians to the Royal Institution" has been conferred upon Messrs. Newton, of Fleet Street.

## ELECTRO-CHEMICAL REVERSALS WITH THIO-CARBAMIDES.*

BY COLONEL WATERHOUSE.

At the meeting of the society in August last, I exhibited some specimens of a curious reversal of the photographic image, produced by adding small quantities of thio-carbamides or sulpho-ureas to the ordinary eikonogen developer, and showed that, although reversal of the image was by no means uncommon, it was usually caused by over-exposure or some other abnormal action of light, whereas, to produce these new reversals, even less than the ordinary exposure was sufficient; and they appeared to be entirely due to some peculiar action of the thio-carbamide, added in very minute quantities to an alkaline eikonogen developer.

At that time I was quite unable to offer any opinion as to the probable cause of these reversals, or as to how they were produced, beyond stating the probability that, although there were many points of difference, they would be found to be in accordance with the generally-accepted theory worked out by Capt. Abney, and were due more or less to oxidation or re-halogenisation of the exposed parts of the film, and that, owing to the peculiar reducing action of the alkaline thio-carbamides, the film, during development, was practically in the same state as if it were over-exposed. It seemed also probable that sulphur was the active agent in producing the reversals.

Further work with these curious salts, and especially with a compound salt of thio-carbamide and ammonium bromide, discovered by Prof. J. E. Reynolds in 1868, and called by him tetrathiocarbamidammonium bromide, which was found to be exceedingly active in producing perfect reversals of the image with very short exposures, led me to the belief that this complete change of deposit from the lights to the shadows of the photographic image must be more or less due to electro-chemical action. The subject of electro-chemistry is one of which I have little knowledge, but I have been able to make some simple experiments, from which, though not conclusive, it seems probable that my surmise is correct, and, so far as they go, they seem to establish that not only, as former observations by Lermontoff, Eder, and Abney, had shown to be probable, is the ordinary process of photographic development of sensitive surfaces containing silver haloids accompanied by electrical action, but that the addition of these minute quantities of thio-carbamides to the developer greatly increases the intensity of the electrical action, and produces a reversal of the current, which should also account for the reversal of deposit.

With the aid of a very sensitive galvanometer, which has been kindly lent me by the Rev. Fr. Lafont, S. J., who also assisted me in the experiment, it was found that, when a pair of pure silver plates coated with finely precipitated silver bromide, one of which had been exposed to light and the other not, were connected to the galvanometer, so as to form a galvanic couple, and immersed in the ordinary eikonogen developer, the exposed plate formed the negative pole, and the needle was deflected to the left; whilst in the developer containing a little thio-sinamine, the exposed plate formed the positive pole, and the needle was deflected to the right.

This experiment has been successfully repeated several times with silver plates prepared in the same way, and with other thio-carbamides, also with silver plates bromised by dipping them in bromine water; and so far the occurrence of the reversal is well-established. I propose to repeat the experiment before you, though I cannot be certain of success. [The reversal was successfully shown with bromised plates, the image of the needle and scale being projected on the wall.]

I have also tried the same experiment with ordinary dry plates rendered conducive in various ways, the best of which appears to be gold leaf applied either on the face of the film or behind it. Gelatine offers very great resistance to the current, and, though I have obtained distinct evidence of currents in both directions, they are not always observable, nor is it yet quite certain that they are caused by electrolytic action within the gelatine film, and further investigation as to this is necessary.

I have also found that reversals of the reduction products, somewhat similar to those obtained by photographic methods, may be obtained entirely without the agency of light by passing a current from a single bichromate cell through a pair of silver plates coated with silver bromide, and immersed in eikonogen developers prepared with or without thio-carbamides. In this case the plate attached to the carbon pole in the plain developer showed only a very little black deposit, whilst the plate attached to the zinc pole showed a very strong, dark deposit all over. A pair of similar plates immersed in some of the same developer, to which a few drops of a solution of thio-sinamine had been added, showed quite different results, the plate attached to the carbon pole showing a strong black deposit, while the plate attached to the zinc pole was almost clear on the face and free from deposit, showing only a slight tarnish, caused by sulphur. I have some plates of this kind here, though the reversed effect is not quite so strong as it was on my first plates. I have found it difficult to obtain such marked reversals again, though I quite believe they are obtainable, and the best conditions or securing successful results have yet to be ascertained. Some similar effects were produced on Eastman's bromide paper, and on ordinary dry plate films attached to the silver plates.

Although results obtained with silver bromide on silver plates are not quite comparable with those obtained with ordinary gelatine plates, these experiments show that, under favourable circumstances, the action of developing solutions on silver bromide is accompanied by distinct electric action, and that these thio-carbamide reversals may be produced by electrical methods, and are attended by a reversal of current. How this reversal of current is brought about is not yet quite clear, but seems to be explained by some observations on metallic sulphides by W. Skey, recorded in vol. xxiii. of the *Chemical News*. He found that sulphides which have the power of conducting can also generate electricity, and that silver sulphide is positive to metallic silver. In a battery consisting of a sulphide and a metal in acidulated water, the gas liberated is sulphuretted hydrogen, the nascent hydrogen exerting a desulphurising action upon the metallic sulphide, the ultimate effect of which is, in some cases, to completely reduce the mineral to the metallic state. He shows also that these sulphides are capable of performing the functions of the negative element of a galvanic couple.

It seems probable, therefore, if electrolytic action does take place in gelatine films during the process of photographic development, that, according to the laws of electrolysis, with the ordinary developers the exposed parts of the plate form the negative pole, and attract the metallic elements and hydrogen, while the bromine, or

* Paper read before the Asiatic Society of Bengal.

other halogen and acid radicals, with the hydroxyl go to the unexposed parts, forming the positive pole.

On the other hand, with the alkaline thio-carbamide developers, at the same time that silver is reduced on the exposed parts, silver sulphide is formed on the unexposed parts, which then become the negative pole, and attract the sulphur, the hydrogen, and some of the silver from the exposed parts; while the halogen and hydroxyl pass to the positive pole, and transform part of the remaining silver into silver haloid, which is dissolved in the fixing bath.

Although this theory, as stated in a rough way, seems to agree fairly well with the facts, and, from the experiments I have made, seems probably the correct explanation of the reversals, I do not feel myself yet able to put it forward authoritatively, and a great deal of further investigation is required. The subject is a very difficult one, beset with uncertainties, and requires more time and close attention than I have been able to give for working it out fully.

The theory that photographic action is accompanied by electrical phenomena is no new one. Becquerel found that if silver plates, coated with silver bromide or other haloid silver salts, were electrically connected and immersed in dilute acid, and light was allowed to fall upon one plate while the other was screened, the effect of the light was marked by distinct electrical action capable of deflecting the needle of a galvanometer. Prof. Minchin has recently found that the same effect is produced on silver plates coated with silver haloids in emulsions of gelatine or collodion, and immersed in very dilute solutions of alkaline bromides, iodides, or chlorides. He has also found that if silver plates coated with a silver bromide emulsion in gelatine are attached to the poles of a battery, and half immersed in a weak solution of potassium bromide, the film attached to the carbon pole is visibly blackened on its immersed part, while no visible effect is produced on the other; but on developing this plate with pyrogallic acid and ammonia, its immersed part also becomes dark, exactly as if it had been exposed to light for a few seconds.

There is a good deal of other more or less direct evidence that an electrolytic action takes place during development, although, so far as I can ascertain, no observations of the currents with a galvanometer are recorded. Comparatively little attention has, however, been given to the question, and electrical or electrochemical action has never been looked upon as a principal factor in the production of the photographic image. From these new results it would appear that—at any rate, as regards the silver haloids—the formation and development of the photographic image is to a very great extent influenced by electrical action, if not actually caused by it. It has lately been found that electrochemical reactions have explained many obscure points in ordinary chemistry, and it seems likely, therefore, that further investigation of photographic action by the light of the most recent electrochemical theories would also throw light on much that is now obscure and uncertain as regards the formation and development of the invisible photographic image. Prof. Meldola, in his "Chemistry of Photography," notes these micro-electrical phenomena in photography as subjects for further investigation, and I hope these experiments may prove a useful contribution to the investigation.

---

Addendum, *September 26th*, 1891.

In some recent experiments, I have obtained indications of a current with an E. M. F. amounting to ·09 volt. during the development, in ferrous oxalate, of an ordinary celluloid dry-plate film (Thomas's thickly-coated landscape) exposed in the ordinary way upon a landscape, with sky and trees; the sky ( — ) end being attached to one pole of the galvanometer, and the tree ( + ) end to the other. The film was previously moistened with a five per cent. solution of potassium bromide, and the ends were held in silver clips attached to the conducting wires, but not allowed to touch the developing solution.

---

## THE LIGHT-FOG DEMON AND THE BEGINNER.

BY "SENEX."

After a little experience, most beginners in photography are able to steer clear of chemical fog, but *the light-fog demon* is one that pursues an amateur in a most exasperating way, for it hoodwinks him so completely that he blames any but the right cause of his failures. Looking over one's friend's negatives, one is very much struck by the fact of the large majority being light-fogged, and if mention be made of this, one is almost invariably told that this is due to over-exposure. However, since most excellent silver or bromide prints can be made from these negatives, the conclusion one naturally arrives at is that a small amount of light-fog does not in any way injure the printing capabilities of a negative. Moreover, the brightly-lit dark rooms of professional photographers certainly seem to produce a little of this result; for, in looking at professional portrait negatives, one is often surprised at detecting light-fog even in these; yet the quality of the prints leave nothing to be desired. If you should happen to indulge in platinotype printing, then it is that light-fog makes itself felt, by producing a muddiness and want of detail, when probably the erring amateur will give up in desperation this artistic method of producing pictures. Eliminate, however, all the causes of light-fog from one's attempts at negative production, and one is surprised with what ease most beautiful results can be obtained; and unless an amateur does not exclude them, the probability is that in a short time he will have discarded photography.

Let us, then, enquire when it is that this demon works his wicked will upon our plates. Taking it for granted that apparatus, camera, and slides are light-tight, when is it that light-fogging takes place? It is either in the dark room or during the exposure.

Concerning the dark room, it must be *absolutely light-tight*, so that after fifteen minutes shut up in it without a light, one can nowhere discern chinks through which white light enters; if one's dark room is, therefore, not perfect, work on in it at night, and do not believe the excuse that, because an infinitesimally small stream is well away from the plate, it cannot hurt the sensitive film. It does, and will do so when you are filling your slides, or taking out an exposed plate for transference to the developing dish. Again, what sort of a lamp have you got? Is it a lantern made of tin, and more or less complicated in design, with a view of preventing white light from shining on the plate? That is exactly where the fault lies. What we want is a lantern which shall not only prevent white light from entering the plate, but shall also exclude any such quality of light from entering the dark room by even one tittle of an actinic ray. In addition, test your lantern when you are testing your dark room, and after your eyes have become as sensitive as those of a nocturnal animal, examine your lantern, top, bottom, front, sides, and back, and look out for chinks or light reflected through ventilating channels. Now, I can scarcely believe that there is a lantern that will stand such a test, therefore with putty, red cloths, and various devices make it as perfect as possible; or, better than that, discard the lantern, and get a window with a well puttied-in pane of ruby glass, not larger than a half-plate, let into it, satisfying yourself that no white light can enter between chinks of the window frame; and, as we will suppose your dark room is not perfect, work only at night, with a candle or lantern outside your window. Do not be inveigled into using yellow glass or tissue, for ruby glass of the most approved shade allows so much actinic light to pass through it that you will fog your plates to a certainty, even when working with a candle, especially if you go in for slow development, and most likely if you use a rapid developer.

Since it is now so universally admitted that one thickness of ruby glass is not sufficient to prevent the light-fogging of gelatine plates, it is even more hopeless to try and work rapid films in such a light. To prove this, develop a plate that has been exposed for two minutes to the red light of your lantern or window, and you will be surprised by the amount of silver that has been deposited by such an exposure.

As it seems that we cannot counteract the actinic properties of even red light by quality, we must perforce try quantity; therefore your ingenuity will suggest that a screen of red cloth or paper must be fixed before your red light—a screen such that it can be rapidly raised and lowered, so that towards the end of development you can momentarily increase your light to see how things are getting on. You are working almost in darkness, but as an amateur, and a beginner, let us say, you cannot be too careful; and you will find, after a little practice, that the glimpse obtained of the developing plate by the momentary raising of your curtain is sufficient to form your judgment of the amount of development attained. Always wash off the developer before holding the plate close to the red light to judge of the density. The curtain can be raised when you want to find bottles, &c. A red light so screened will allow of your opening boxes of plates in perfect safety; even then do this in the shadow—say of your table. Since tin lanterns are so unsafe, a simple device is to cover them with a blackened box having a red glass or tissue window, and screened ventilating apertures.

Fogging also takes place during exposure; it occurs by reflected light reaching the plate, when the shutter is drawn through the slit in the lens tube used to insert the stop. As almost every lens is fitted with Waterhouse diaphragms, it is impossible to make them fit so perfectly that no light can enter; therefore, to prevent such an untoward circumstance, bind a long strip of black cloth round the lens tube, so that *the stop aperture shall be light-tight*. It is extraordinary how few amateurs know of this. To prove it, raise the ground glass, stop and cap the lens, and cover your head and the camera (not the stop slit) with the black cloth, and notice, when your eyes have become accustomed to the gloom, how much light really enters through this fatal slit. An innumerable number of negatives are fogged by this and called over-exposures. Thus, how frequently one hears and reads accounts of over-exposure of half-plate landscapes with the smallest stop, having received a four-second exposure—an impossibility as regards the picture, but true enough when applied to the amount of light that reached the plate, for fogging has been going on between the moment of drawing the shutter and the removal of the cap. I have given with half-plate R. R. lens *and f/64 stop* (the smallest) eight seconds to brightly lit Himalayan snows without foliage, and not found it too much; but then, though the plates were extra rapid, the negatives were produced without fog. Light-fogging also occurs when photographing towards the sun by the direct rays shining into the lens tube, and if the slides are exposed to sunlight. The prevention required to neutralise those two causes is obvious.

Having eliminated all sources of light-fogging, it is wonderful how impossible within reasonable limits it is to over-expose; and again, with full exposure, what beautiful features a negative will possess, supposing it to be one required to show a dark foreground, distant snow-clad hills, and the delicate shading of clouds; these will appear with the requisite tone and details.

After all, what is a negative that shows no light-fog? It is one whose border is perfectly clear, and whose very deepest shadows only show clear glass. Lastly, as a beginner, fly from light-fog as you would from a loathsome disease. The experienced photographer can manipulate plates in an actinic light; but, as an amateur and a beginner, you cannot; so do not copy him till you are proficient.—*Journal of the Photographic Society of India.*

## LUMINOUS PAINTS.

For *orange luminous paint*, 46 parts varnish are mixed with 17·5 parts prepared barium sulphate, 1 part prepared India yellow, 1·5 parts prepared madder lake, and 38 parts luminous calcium sulphide.

For *yellow luminous paint*, 48 parts varnish are mixed with 10 parts prepared barium sulphate, 8 parts barium chromate, and 34 parts luminous calcium sulphide.

For *green luminous paint*, 48 parts varnish are mixed with 10 parts prepared barium sulphate, 8 parts chromium oxide green, and 34 parts luminous calcium sulphide.

A *blue luminous paint* is prepared from 42 parts varnish, 10·2 parts prepared barium sulphate, 6·4 parts ultramarine blue, 5·4 parts cobalt blue, and 46 parts luminous calcium sulphide.

A *violet luminous paint* is made from 42 parts varnish, 10·2 parts prepared barium sulphate, 2·8 parts ultramarine violet, 9 parts cobaltous arsenate, and 36 parts luminous calcium sulphide.

For *grey luminous paint*, 45 parts of the varnish are mixed with 6 parts prepared barium sulphate, 6 parts prepared calcium carbonate, 0·5 parts ultramarine blue, 6·5 parts grey zinc sulphide.

A *yellowish-brown luminous paint* is obtained from 48 parts varnish, 10 parts precipitated barium sulphate, 8 parts auripigment, and 34 parts luminous calcium sulphide.

*Luminous colours for artists'* use are prepared by using pure East Indian poppy oil (in the same quantity) instead of the varnish, and taking particular pains to grind the materials as fine as possible.

For *luminous oil-colour paints*, equal quantities of pure linseed are used in place of the varnish. The linseed oil must be cold pressed, and thickened by heat.

All the above luminous paints can be used in the manufacture of coloured papers, &c., if the varnish is altogether omitted, and the dry mixtures are ground to a paste with water.

The luminous paints can also be used as *wax colours for painting on glass* and similar objects, by adding, instead of the varnish, 10 per cent. more of Japanese wax, and one-fourth the quantity of the latter of olive oil. The wax colours prepared in this way may also be used for painting upon porcelain, and are then carefully burned without access of air. Paintings of this kind can also be treated with water-glass.—*American Druggist.*

## LIGHTING.*

BY JOHN S. SCHNEIDER.

We all know that one of the most necessary things in securing a good picture is that it must be properly lighted; and now the question arises, when are our subjects properly lighted? If you were to ask an operator, "How do you get this or that effect?" he would not use many words in trying to explain to you how it is done, but he would invite you under his light, and then, with the shifting of a background, the drawing of a curtain or two, and the placing of a reflector or screen, he would soon demonstrate to you how it is done, and you would be thankful for the instructions received.

The operator has his eye trained, and is so familiar with his light, that it is no task for him to perform. By experience we train our eyes and hands so that it becomes a sort of second nature to us, and we never stop to think, "Why do I pull down that curtain, and why do I not pull down this one?" We know by placing our subject here we get one effect, and by placing it there we get another; and so it is in everything we do under the light.

Now, I will ask, is your eye trained to that point of excellence where you can always rely upon it as your guide in your work? If it is not, your work will show it, and it becomes your study to at once seek further information. This can be done by practice and experiment until you get the desired effect, and when you once get it you can get it again. How often do we pick up a picture made by a fellow photographer which in effect is different than anything we have ever produced, and we say, "That's fine; how did he get it?" but here is where so many of us stop. Why not take that picture and study it, and at the very first opportunity try to reproduce it? If you don't succeed at first, try it again, and you will soon see that your work is improving, to your joy and your customers' satisfaction. By this I do not mean that we should always pattern after our neighbours, but a little of it can do no harm; it will always lead to something new, and we become more original from day to day. Why is it that we find so many of us are not making the advancement we ought to make? Why is it that our work is not being picked up by others as models of photographic lighting? Is it not that we do not pay enough attention to the training of the eye?

I said it becomes second nature to us. How often do we find ourselves noticing the lighting in the face of a speaker, as he steps from one position to another; or, in fact, wherever we are, in the parlour, or in a street-car, if our minds are not busy with some other important subject, we find ourselves engaged in lighting faces. So it is, and always will be.

But, you ask, "In what direction shall I train my eye? Shall I train it to make bold, strong lightings, or shall I train it to make weak or soft lightings?" This, I will say, is always controlled by the subject, and by other circumstances, although in some cases we will find a bold lighting preferable. It is not necessary that a bold lighting should be a hard lighting; it can as well be soft and round. To get this effect, I always prefer to place the subject well under the light, and to work with the light considerably open. You will find by doing this your lighting will be soft and round; in other words, your subject will be well illuminated. You cannot expect to get a rich lighting unless you have plenty of illumination. This will help to round the face and give the drapery the richness that is so desirable, be it black or be it white. I said place your subject well under the light; by this I mean to get out under the light from four to six feet, and to work with a considerable amount of back light. This, I find, is a help, especially in white drapery; and in all shadows or Rembrandt lightings, as well as in the ordinary plain lighting.

There are a great many lightings which are called fancy lightings, as, for instance, the one which throws the face all in shadows—that is, a profile in shadows; and a great many can easily be had by coming out under the light. But here I should like to say that the great secret in all lightings, shadows plain or fancy, is to illuminate your shadows. I believe in the theory of contrast lighting. Make your lightings light with detail in the lightest lights, and make your shadows deep with illumination in the deepest shadows. If you do this your roundness, brilliancy, and strength will come by itself. There are many reasons why a subject well illuminated is better, and the one above all is, it saves your retoucher a great deal of work, it gives him the modelling that is desired, and he can give you a better and more satisfactory piece of work.

It is not only necessary to illuminate your subject, but it is also very important to illuminate your background. If you do this you will find that your subject will stand out from the background, and you will get an atmospheric effect. This is very important towards the light or from the light, any way to get contrast between your subject and background.

Now I should like to call your attention to another and very important point, and that is *direction of light*. If you take unto yourselves the pleasure of going through some of our great artists' studios, and studying their pictures and studies of art, you will find in all of them a direction of light—that is, by looking at the picture you can see the direction from which the light came which illuminated the study. Now this is the point. Have your subject so illuminated that, by looking at the picture, you can see the direction of light, or, in other words, on which side of the face the side light was. If you will always bear this in mind you will find it of great benefit to you. Why is it that we see so many flat and weak photographs that (to use a slang phrase) make us tired of them? They have no strength or brilliancy, or, in other words, no direction of light. They are flat because the operator did not illuminate the subject; he failed to give it light and shade, lightings and shadows. The idea is, to give your work an artistic merit your lighting should always be full of art. It is the lighting, above all, that gives your work tone and style.

* Abstract of a paper read before the Ohio Photographers' Association.

---

A Perfect Ink.—An ink which is said to be permanent and unaffected by the application of acids, alkalis, &c., and which renders forgeries and erasures, additions, or alterations easy of detection and difficult to accomplish, is said to be made as follows. To carbon black (preferably prepared by the action of concentrated sulphuric or other acid on sugar) are added a solution of gum or other mucilage, caustic soda, oxalic acid, and Indian ink. Vanadium in any form, Aleppo galls, nut galls, and a small quantity of an aniline dye are then added, with sufficient water to make the ink flow readily. The following proportions yield good results:—Nut galls, 20 per cent.; Aleppo galls, 5 per cent.; carbon black, 10 per cent.; vanadium, 1 per cent.; Indian ink, 10 per cent.; oxalic acid, 3 per cent.; aniline dye, 1 per cent.; rain water, 50 per cent. The whole is boiled, filtered, and strained.

## Notes.

"A mania for platinum" was the excuse offered the other day on behalf of a poor fellow who helped himself to two dishes of that metal to which he had no legal right. There are many photographers now-a-days who are afflicted with the same mania, only their madness has more method in it. They are more addicted to depositing the salts of the precious metal upon their prints than they are to depositing the metal itself in their pockets.

After quoting a recent note from these pages, which suggested that a factory for gelatine plates might, under certain conditions, be started in our Eastern Dependency, *The Journal of the Photographic Society of India* comments thereon as follows:—"Plate-making in India has been done, although only by enthusiastic amateurs, I believe. But there are several hill stations where an industry of the kind could be carried on with every advantage as regards low temperature, and many stations on the plains of Northern India where the temperature in the mornings for six months in the year is low enough for anything. It has always been a matter of surprise to photographers out here that something of the kind has never been attempted. Labour is cheap, the native is easily taught, and soon becomes a deft workman under European supervision. The market is a large one, and accessible at reasonable cost, thanks to railways, water communication, and the post office; so that a good brand of plate freshly made and moderately priced could command it. The only problems before the man of enterprise, therefore, are connected with the manufacture itself, and, if he has the skill and money to surmount them, he might reap a rich reward in a well thought-out and skilfully conducted plate-making factory in India."

Summer is a'coming in. Yes, when autumn chills and falling leaves should gather round us and hedge us in, the cold weather suddenly disappears, the clouds which have hid the sun from us for so many weeks have retired into private life, and all is sunshine and brightness. At least, it is so at the time of writing, but who knows what the morrow may bring forth, and whether or not we are giving our readers a chance of laughing at us for such an optimistic opinion of such a sorry thing as English weather. The boys and girls have packed up their cameras and gone back to scoool, the clerk also with his photographic apparatus has resumed his desk work, and holidays generally are over. The clerk of the weather has the country all to himself, and, after deluging it with rain when the corn was lying about to spoil, he laughs in his sleeve and pours a flood of sunshine on the land.

There is no more annoying thing to the tourist photographer than bad weather. Some few we know who like it, or say that they like it, and talk about the beauty of misty mornings, effects of atmosphere, and so on, but the average being prefers downright baking sunshine. A few clouds scudding across the sky are not unwelcome, but when those clouds are laid on for the sole interest of the umbrella industry, one gets tired of them, and longs for free trade.

Amateurs in search of a novel photographic Christmas card with which to amuse their friends might take note of the result of an experiment with a black background, which is figured in *La Nature* of the 19th inst. The illustration represents a little girl drawing in a mail-cart an enlarged head of her brother, whose face wears a grotesque grin. The experimenters—MM. P. et F. Leprince—made use of an open doorway, the gloom of which served as a black background. The first exposure was made about seven metres from the little girl and the mail-cart, the second about one metre from the head of the lad. During the second exposure, a blackened cardboard with a hole in the centre was held some little distance in front of the lens, so that only the head was received on the plate. The effect is very droll, and is capable of many variations, which will suggest themselves to the ingenious amateur.

Some of the London newspapers, in noticing the Photographic Exhibition, have made curious discoveries. One evening paper notes that "a new era has been entered upon, and that the Royal Society (*sic*) is likely henceforth to take its proper position in the country." What this means it is difficult to say, but at least the critic is premature in assuming that the Photographic Society has attained the honour which the president desires for it, namely a Royal charter. But the statement of this writer is not so remarkable as those of the representative of a weekly journal. The critic is effusive over the "long-desired improvements effected with regard to the reception and display of the exhibits," and goes on to tell us that "a new body, entitled the 'Management Committee,' has been appointed, which has relieved the council of many of its functions." Here is news indeed! So far as we know, none of the members of the Society are aware of the existence of this management committee, but if such a body has been appointed, there will be no little curiosity expressed as to what the committee is supposed to manage, and of what functions it has relieved the council.

The representative of the paper in question seems to have "improvements" on the brain, for further on he remarks, "the opportunity was taken while refreshments were being indulged in, after the inspection of the gallery, to felicitate the president on the improvements which had been effected." What improvements can these be? Surely the gentleman who is at once so vague and so enthusiastic can never have been at one of the Society's exhibitions before. One would like to have had his criticisms on the photographs, but unfortunately he carefully avoids mentioning a single picture, reserving his praise for the automatic plate-cutting machine. No one would guess from this "notice" that any photographs at all were exhibited.

The German Emperor has done his duty to society and the world. Having grown a beard, he has, when it was deemed to have arrived at maturity, been photographed. It is remarked that the latest picture does not represent him in the best of tempers, but His Majesty is not so conciliatory to photographers as is our Prince of Wales. It is said when the former was at Windsor, noticing that a photographer was making preparations with a camera for taking him, he turned his head away and obstinately refused to gratify the operator. We remember, on the other hand, seeing the Prince of Wales, when at Hastings in connection with some public function, give orders for his carriage to pause, so that a local photographer who had planted his camera on an elevation might have a fair shot.

## THE EXHIBITION AT PALL MALL.

This Exhibition, which opened with the usual *soirée* on Saturday evening last, and to the general public on Monday, is perhaps the most interesting one of recent years. It is true that nothing of a very novel or startling character is shown either in the way of pictures or apparatus, but, at the same time, there is greater variety than usual to hold the attention of visitors, and we therefore say that, on the whole, it is likely to prove a success. It would seem that either the Committee had an unusual number of good pictures to deal with, or that they had ruthlessly eliminated the bad ones, for the Exhibition is distinctly above the average.

The judges elected by the members of the Society are named at the head of the catalogue. They are, J. E. Austin, F. Hollyer, P. H. Newman, F. M. Sutcliffe, and J. B. B. Wellington. It may also be noted that the Exhibition will remain open for six weeks—that is, until the 12th of November—from ten to five, when the charge for admission will be one shilling, and that the gallery will also be thrown open on Monday, Wednesday, Thursday, and Saturday evenings, when the charge will be sixpence. As the optical lantern will be shown on each of these evenings, we may certainly say that the public have the offer of a very cheap sixpennyworth.

A glance round the walls of the gallery at Pall Mall will soon convince the most careless observer that the art of photography is progressing. There is an entire absence of those show-case portraits which were so common in former years, and a striving by all after more originality and artistic effect than a few years ago would have been thought possible in a photograph. A larger proportion of space than usual is occupied with pictures which are the result of mechanical process, and these are of such high quality that there is no room for doubt that in this department, as in others, the advance has been by leaps and bounds.

With regard to the other pictures, we observe that a great number of different printing processes have been adopted, and the compilers of the catalogue have done well to note the particular process fancied by each exhibitor. Thus, some of the pictures are labelled in the catalogue *Obernetter's Gel-Chloride*, others *Celerotype*, and so on. This feature is to be commended, because it gives the Exhibition an increased educational value to those who strive to learn.

The first picture catalogued is a fine direct portrait by D. Pym, which, hung rather high, gives one the idea of a fine steel engraving. Mr. Hilditch comes next with an admirable winter scene, "Sunrise on the Ice-bound River." The same worker has a far better picture (No. 51), "Ice Floes at Richmond, January, 1891." We mention these two works together because both represent the same scene, namely, the well-known view of Richmond Bridge looking up stream; but, while the first-named has a flat and obliquely lined foreground made up of the snow-covered tow path, the second, by a small alteration in the position of the camera, relegates the flat ground to a minor place, and fills up the foreground with huge hummocks of ice left by the receding tide on the river's brim. Mr. W. W. Winter, of Derby, may always be relied upon to bring to the Exhibition some of his exquisite portrait studies, which are so deliciously unconventional in treatment. Take, for instance, No. 9 ("The Misses Hewson"), and compare it with the monstrosities in the shape of portraits which, up to a few years back, were constantly showered upon an ignorant public. In this picture are two ladies standing together, one reading a letter, the other listening with evident interest to the recital. The pose is so simple that few photographers would have thought that a picture could be made of it, but it is natural, and the figures, too, are so graceful that attention is at once attracted to them. Besides two more portraits of large size, Mr. Winter contributes a frame of children's pictures, which are full of the natural buoyancy of youth.

The past winter (we are now referring to the season so called) gave photographers of the hardy type plenty of opportunity for picturing snow-scenes, and Nos. 23 and 25, by A. Hendry, which he calls "fog landscapes," are excellent examples of this work. Both are little gems in their way, with the distance in each case lost in mist. Such treatment of snow-scenes is admirable, for it permits the whitened twigs and foreground bushes to stand out clearly against the sobered-down background. Mr. Ennis has here several capital river scenes, not of that bright, sunny character which such subjects are generally made to assume, but as such scenes appear at early dawn or dewy eve, when there is little light, and what there is is chequered by rising vapours. Truly, there is a fashion in photography as in most other things. A couple of years ago there was a run on cottage doors with peasants standing on the threshold engaged in various occupations. Mr. Gale and Mr. Davison led this fashion, and gradually all the cottage doors in the kingdom came to be used up, so many imitators were there of these successful workers; and although Mr. Gale in the present Exhibition does show one exquisite cottage door subject (No. 112, "The Village Tradesman"), the general tendency of the subjects is to river scenery, scenes with damp mists which spell "neuralgia," but which make decidedly effective pictures. In a space of two square yards on one wall of this Exhibition there are no fewer than ten of these dusky river scenes, without taking count of those just mentioned. There is far more variety in them than in village doorways, and some are really lovely. One, indeed (No. 49, "Sunset, Winter"), by Mr. Cembrano, has been awarded a medal, and it is certainly worthy of the distinction. In Nos. 27 and 28 Mr. W. R. Cassels shows that he can produce beautiful work, but we hardly think that he has done the best that could be done with the materials at his disposal. A little more contrast of light and shade might have turned these photographs into far more satisfactory pictures. When seen in their natural colours on the focussing screen these subjects must have looked very beautiful, and even the most skilful photographers are sometimes deceived by such a promising appearance into the hope that the subject will be as attractive in monochrome. Two other pictures (Nos. 29 and 30) are far more satisfying, but these would have been improved by a background not so glaringly white.

Messrs. Russell and Son, of Baker Street, make a brave show with their "at home" portraits, two of which (Nos. 31 and 35, "The Rev. Mr. Galloway," and "H.R.H. the Duke of Edinburgh") are of very fine quality. In one respect, the photographer who has been honoured by a sitting from Royalty labours under a disadvantage. Royal personages are so often photographed that one is apt to pass their pictures by "as a tale that is told," and told so often that one knows them by heart, so to speak. But this picture of the Duke is really a good one, although the various medals, stars, and other decorations of the uniform unconsciously cause the eye to stray from the face. No. 43 is a funny little picture of the West London Photographic Society at the Castle Hotel, Hampton Court. Funny, because the members are all sitting at the dinner table looking uncommonly hungry. We trust that the exposure was not so long as the expression of these famished beings seems to indicate.

Passing by another winter scene by Mr. Hilditch, we light upon three fine pictures by Mr. H. P. Robinson, Nos. 69, 70, and 71. The last named, "Shakespeare's Cliff," is, in our opinion, the best of the trio. Is it that the beautiful scene is one upon which we have often feasted our eyes that this fine picture seems to be so attractive to us? The wonderful headland seems in this photograph to be lost for the moment in shade, while the sea below is spangled with sunlight patches. And how well the sober grey sky contrasts with the silver water beneath it. Next to claim attention are Mr. Lyd. Sawyer's admirable character sketches, with their bold effects of light and shade. In No. 78, "Reflections," a girl is holding a hand-mirror against a candle, and reflecting the light upon her well-favoured features. A new pose this, and an effective one too. In No. 79, "The Last Rehearsal," we see two girls singing from the same music book, with a strong light in their animated faces coming from a concealed lamp. No. 80, "Lighten our Darkness," is of a more pathetic character. A blind man is reading with his finger-tips from the familiar embossed type, the light from a lantern in front of him being cast upon his troubled visage. This picture would have been improved if some more natural form of lighting had been adopted. A lantern would, of course, be useless to a sightless reader, and it therefore appears to be quite out of place, or introduced to meet the convenience of the artist. In No. 81, "The Toper," we have a more effective picture still with the same brilliant lighting; in this case the radiance comes from a candle hidden behind a jug on the table.

No. 84, "The Gipsy Maid," is a very pleasing study of a laughing girl, by E. Spencer; and No. 85 again brings in the use of the hand-mirror, by Mr. Lyd. Sawyer; but, in this case, it is a nigger who admires him or herself (we are doubtful about the sex of the individual) in its bright surface. Nos. 86 to 89 are four 15 by 12 landscape studies by Mr. J. P. Gibson, the first, "The Woody Banks of the Tyne," being of very fine quality. These prints, apart from their great merit as pictures, bear favourable witness to the excellent effects attainable by Mr. Valentine Blanchard's platinum toning process. Mr. Horsley Hinton contributes eight large landscapes on rough drawing paper; one especially, "The Evening Ebb" (No. 98), is a fine study of a sandy shore, the picture being made up of very simple materials; but it is a pity that the print has not been so trimmed as to correct a slanting horizon. "An Essex Marsh" (No. 99), by the same hand, and "A Reedy Corner" (No. 101), are also both very true to nature; but some of the others of the series are too heavy and brown in their imitation of sepia drawings to be satisfactory as photographs.

Mr. Gale has six beautiful little pictures (No. 112 to 117), which, it need hardly be said, are as perfect in technique as they are artistic in conception. No. 117, "A Homestead in the Orkneys," is a different subject to those usually affected by Mr. Gale, and one full of beauty, although the materials would not seem very promising.

Mr. A. Burchett's three figure subjects, "A Knight," "A Highland Spinner," and "The Sailor's Daughter," show capital work, the spinner being the best of the three. These pictures bring us to the end of the gallery, where the Woodburytype Company have hung three very large pictures, each of which is labelled, "Quite unretouched." The centre of the three is a fine carbon enlargement of Chester Cathedral Choir. No. 143 is a view of Hawarden Castle, and No. 229 a fine picture of Chatsworth House. Close by we come upon the first of Mr. W. J. Byrne's contributions, a frame of children's portraits, entitled, "The Alphabet Illustrated," the illustrators being little dots of four years and under. This is quite a happy idea, and one feels a child again in tracing this account of an apple pie, and how B bit it, and C cut it, and so on to the last letter, "which ends this strange eventful history."

Mr. Gambier Bolton, and the numerous other workers who have paid successful court to the animals at the Zoological Gardens, have a formidable rival in His Grace the Duke of Newcastle, who proves, in Nos. 159 and 167, that he knows how to picture wild beasts. From the same hand come Nos. 165 and 166, views on Lago Maggiore. Here, too, we must notice some character studies by Mr. A. G. Tagliaferro (Nos. 168 to 171), which, apparently, are attempts to compete with that type of Continental pictures in which priests figure, and of which "A Good Story" is perhaps the best known example. In No. 169 a priest is sitting at his supper table, while a waiting-maid is about to open a bottle of mineral water in dangerous proximity to his face. In No. 169 the same priest is curiously examining a picture on an easel, the accessories of the picture being much the same as in the last instance. In a third picture he is reclining in a chair reading a newspaper. These pictures are well arranged and natural, but the subjects are not so interesting, perhaps, as they might have been made.

*(To be continued.)*

## PHOTOGRAPHIC CHEMISTRY.*

BY PROFESSOR R. MELDOLA, F.R.S.

Respecting the view that these compounds contain metallic silver, the fact that the chloride darkens under nitric acid may be taken as evidence to the contrary. The discussion of the possibility that sub-haloids are present will link this part of the subject on to the purely chemical considerations dealt with in the last lecture. The possibility of the coloured products containing oxygen—*i.e.*, being of the nature of oxyhaloids—is also worthy of being entertained. In favour of this view is the analogy of cuprous chloride, which darkens only in media which can supply oxygen, and which, under these circumstances, apparently forms an oxychloride. In the same sense may be interpreted the distinct sensitising action of water already referred to. On the other hand, it may be pointed out that the chloride darkens in a high vacuum (*i.e.*, in the presence of mercury vapour), and under liquids such as pure benzene, petroleum, and carbon tetrachloride, which contain no oxygen, and which have previously been dried by chemical methods. The question thus assumes the form whether the nature of the coloured products may not vary in different media; whether, in easily halogenised liquids, such as benzene, the reduction might not be analogous to that which occurs in hydrogen; whether in other cases, the unsaturated silver haloid residue may not form a coloured compound with the organic product; and so forth. It may be pointed out that such questions as these open a wide and interesting field for experimental investigation.

With regard to the second point—the action of the substance associated with the silver haloid—it is legitimate to connect this action with the ordinary chemical processes with which the

* Concluded from page 679.

student has been familiarised. He has been taught that reduction and oxidation are concurrent in ordinary chemical reactions, such as when a silver salt is reduced by a ferrous salt. The principle can now be extended to photo-chemical reactions. With the exception of a few cases of pure dissociation (such as the resolution of gold oxide into metal and oxygen under the influence of light), which have uo direct bearing on photographic processes, the photo-chemical changes with which the photographic chemist has to concern himself may all be considered from the same point of view as those which have beeu made use of by way of special illustrations. There is no fundamental difference in principle between the action of light on a mixture of ferric chloride and oxalic acid, or mercuric chloride and ammonium oxalate, and its action on a silver haloid mixed with water, silver nitrate, sodium sulphite, gelatine, or any other organic compound capable of being oxidised or halogenised. The only differences are in the relative velocities of chemical change, and in the circumstance that in the case of such metals as iron and mercury the products are definite and known, while in the case of silver the products are indefinite and unknown. The student will thus be led, without a break, from ordinary chemistry to photo-chemistry, and from the latter to the chemistry of photographic processes. He will now realise that the photographic film is to be looked upon as a system of chemical compounds capable of undergoing atomic re-arrangement under the iufluence of the external energy of light. He will grasp the full meaning of the term "sensitiser," and he will see that the function of the latter is quite as important as that of the silver haloid itself.

From this point the practical study of photographic methods, the preparation of emulsions and films, the uses of collodion and gelatine as vehicles, the action of preservatives, and all the technical details of modern processes can be taken up or resumed. Then in natural sequeuce will follow the consideration of the nature of the photographic image, and its connection with the coloured products resulting from the prolonged action of light on the silver haloids. At this stage, again, caution is necessary, and dogmatic statements must be avoided. The action of light ou the sensitive films in use in photography, including all the films employed for producing pictures in the camera, from the iodised silver plate of Daguerre to the gelatino-bromide plate of modern times, gives rise to uo visible product of photo-chemical decomposition. Of the nature of the material composing the invisible image we know no more than we do of the composition of the coloured products of photo-chemical decomposition or of the photo-salts.

The invisible image is either the product of chemical decomposition, or it is uot. If it is not, then some other explanation must be invoked. The only other view is that the energy of light is not at first used up in doing chemical work, but that before true chemical decomposition occurs there is an intermediate stage, during which the energy is engaged in loosening the affinity between the atoms of the halogen and the silver. According to this view, we should have to regard the first action of light on the sensitive film as a purely physical action, resulting in the formation of an uustable modification of the silver haloid, more easily reducible than the ordinary modification. It might be thought that such a physical modification would be easily producible by the limited action of light on the pure silver haloid, but, as far as my own experiments have gone, this does not appear to be the case. By exposing pure, dry silver bromide films, obtained by the method already described, for sufficient time to produce a well defined, developable image on a photographic plate, uo difference in the reducibility of the exposed and uuexposed parts could be detected. In fact, the films of the pure haloid are so insensitive that an exposure to bright suulight of sufficient duration to completely solarise the slowest of modern dry plates, showed no difference in reducibility by potassio-ferrous oxalate or alkaline-pyrogallol, between the exposed and unexposed portions of the surface. The conclusion to be drawn from these experiments is, that in this form the silver haloid cannot be converted into a more easily reducible physical modification by any moderate exposure to light —certainly not by an exposure considerably greater than that necessary to impress an image ou a gelatino-bromide plate.

At this point the question of molecular aggregation comes into consideration. In considering this part of the subject, attention may be called to the experiments which the student has already been recommended to make in connection with the modifications of the haloids. His experience in the preparation and ripening of emulsions will also render good service in enabling him to fairly consider the evidence. It is possible that some weight—how much it is not yet possible to decide—may have to be given to the state of aggregation as a factor in determining the extreme sensitiveness of the photographic film.

We are thus brought face to face with the remarkable fact that a film of pure, dry haloid gives no product which is more easily reducible than the original haloid by any reasonable amount of exposure to light. Let the same haloid be diffused in fine particles throughout a sensitising vehicle such as collodion (with the necessary preservative) or gelatine, and an exposure for a few seconds, or a minute fraction of a second, gives a product which is far more readily reducible than the unexposed haloid.

From many experiments which might be made or quoted, it will be made clear to the student that the function of the sensitising vehicle is of a very high order of importance. It will be seen also that the particular vehicle now in vogue—gelatine—is a particularly good sensitiser, and it is legitimate to connect its sensitising action with its well-known power of taking up bromine. It may be asked whether it is more probable that mere contact with a solution of gelatine should so alter the physical condition of the haloid (as in the last experiment) as to convert it from a comparatively insensitive to a highly sensitive physical modification, or whether it is more probable that the gelatine should act iu the same way as the reducing agents used as sensitisers in the former experiment with the coated papers. It may, I think, be fairly taught that the balance of probability is in favour of the purely chemical action of the gelatine. On the other hand, in favour of the view that some weight must be given to the state of aggregation, it may be pointed out that the silver bromide on glass, although considerably increased in sensitiveness by contact with a gelatine solution, is still much less sensitive than the emulsion.

If, therefore, it is regarded as improbable that mere coutact with a gelatine solution can alter the physical condition of the haloid, it may be asked what happens during the ripening of an emulsion. The student will have learnt that, wheu silver bromide is first precipitated in gelatine, the emulsion is comparatively insensitive. It is only by long contact with the gelatine solution at the ordinary temperature, or by the action of heat for a shorter period, that the emulsion acquires its maximum sensitiveness. The conditiou of the bromide particles in an emulsion is, from the beginning, very different from the condition of the bromide on a film prepared by brominating a silver mirror on glass. Nevertheless, I do not believe that we are at present justified in teaching dogmatically that the whole increase in sensitiveness is due to physical modification only.

From this stage onward, the practical study of photographic processes may be carried on hand in hand with the demonstration of the chemical principles concerned. The photographic image will be regarded as being most probably composed of a product of true photo-chemical decomposition. This product may, or may not, be identical with the "photo-salts," but it is not improbable that its composition may vary according to the nature of the vehicle with which the silver haloid is associated. The sensitive film which is now in general use will be regarded as a "gelatino-bromide," iu the same sense that the term "gelatino-nitrate" has been employed. The photographic image will be looked upon as a design on the surface of the gelatino-bromide, composed of a chemical product more easily reducible than the gelatino-bromide, and invisible simply because of the extreme tenuity of the deposit. When a reducing agent is applied, the material composing the invisible image is alone reduced to metallic silver, and the picture is said to be "developed."

The subject of development may uow be dealt with, and the chemical priuciples of the process demonstrated. It is necessary to commence by pointing out that a photographic developer may act in two distinct ways. In development by vapour, as in the Daguerreotype, and in the so-called acid developers, there is an accumulation of finely-divided metal (resultiug from coudensation in the case of mercury vapour, and from chemical reductiou in the case of acid developers) on the material of the invisible image only. If, for example, silver nitrate is reduced by ferrous sulphate or pyrogallol, the pulverulent deposit of metal accumulates by preference on the product of photo-chemical action, aud continues to be deposited thereon as long as there is silver being deposited from the developing solution. Where the silver deposit has once formed, there it continues to grow by accretion, and the developed picture is built up of metallic silver. The action is, doubtless, of an electrolytic character, the material of the invisible image and the unaltered haloid formiug the two elements of a galvanic couple, and the developing solution playing the part of the electrolyte.

The other kind of development effected by such reagents as ferrous oxalate, alkaline pyrogallol, eikonogen, and hydroquinone, must be regarded as also due to reduction ; but in these cases it is the material composiug the invisible image which is directly reduced. This constitutes the so-called alkaline development. It must be taught, in connection with this subject, that the silver deposit which results from the reduction of the invisible image is not the exact equivalent of the quantity of material composing that image, but that the reduction commenced on the portions exposed to light extends downwards through the film as long as the developer is actiug. In fact, it must be made clear that the silver deposit *grows* by a coutinued reductiou, the action iu this case also being most probably electrolytic, the elements being the first film of reduced silver, the unchauged haloid with which it is in contact, and the developing solution as the conducting medium.

The final result of both kinds of development is the production of a silver picture, composed of far more silver than can be accouuted for by the actual quantity of the material composing the invisible image. The two kinds of development may be classified as "accretional" aud "reductional" (chemical aud physical, according to the Coutinental photographers).

Having mastered the principles of development, it is importaut that the student should have his attcution directed to certain phenomena which connect this subject with the initial action of light on the photographic film. He will have learnt from the previous demonstrations that the photographic image with which he is practically familiar is most probably a product of photo-chemical decomposition. He will thus be prepared for the proof that chemical reducing agents may act in the same way as light ; that is to say that, by employing a very slow reducer, and allowing it to act on the silver bromide for a short time, the reductiou is carried to the same stage as that which results from the initial actiou of light. The process of reduction can be arrested at the invisible stage—at a stage intermediate between the haloid and the free metal. The product thus formed, whatever its compositiou may be, is more easily reducible than the original haloid, and can therefore be "developed" by ferrous oxalate, &c., in just the same way as the iuvisible image.

Another fact bearing on the present subject which must not be overlooked, is that mechanical force of the nature of a shearing stress also produces a developable impression on a silver haloid film.

In connection with the necessarily related subjects of exposure and development, the phenomenon of reversal must be dealt with. I have already expressed the view that this phenomenon is best regarded as reversed chemical action between the halogenised sensitiser and the material of the invisible image. In the broadest possible terms, all that we have to consider is that the "photo-salt" in contact with a sensitiser containing more thau a certain quantity of halogenising or oxidising material, has the tables turned upon it, to speak metaphorically, aud then acts as a sensitiser towards the film which at first acted as a sensitiser towards it.

Having brought the student up to this stage of knowledge, we must leave him in possession of a silver picture produced by developmeut, aud the chemistry of the subsequeut operations of fixing, clearing, intensifying or reducing, printing, toning, and so forth, will be comparatively simple. With regard to these subsequent operations, all that has to be borne in mind is that, after fixing and washing, the image is composed of a graduated deposit of metallic silver, and that all the changes that are wrought upon it by intensifiers or reducers are simply the result of ordinary chemical transformations. Thus, the principle of intensification may be demonstrated in the usual way, viz., by producing a design in silver on paper, as in the first lecture, then bleaching it by immersion in a solution of mercuric chloride, and, after washing, converting the mercurous chloride formed into the dark dimercurous ammonium chloride. The final result is a more opaque image—the latter has become intensified.

## AN OBSTACLE TO OUR FOREIGN TRADE.

The secretary of the Decimal Association writes as follows:—

It will be remembered that receut Consular reports from Italy and Japan have referred to the loss of trade owing to firms in England sending to those countries circulars and price lists based on the English weights and measures. The metric system is used in those countries, and our French, German, and other competitors use it in their quotations ; but the English firms are content to puzzle buyers with weights and measures which are very troublesome, and not understood.

A similar complaint now reaches us from Egypt, and the Consular report just issued ("Annual Series of Foreign Office Reports," No. 944) points out that our weights and measures are "utterly unintelligible" to a large proportion of the persons to whom export houses in this country forward their circulars and price lists in Alexandria and Cairo.

The metric system of weights and measures is in force in Egypt, and exporters of English goods to that country should, of course, adopt it iu their quotations and transactions. Not to do so is, indeed, suicidal shortsightedness, and it is to be hoped that the day is not far distant wheu the metric system of weights and measures will be generally adopted in England. If this needful reform be uot soon undertaken, there is little doubt that our foreign competitors will get a hold of our customers abroad which it will not be easy to shake off.

In Australia, it has beeu suggested that the adoption of the metric weights and measures should be carried out as one of the early labours of the coming Commonwealth Government of Federated Australia. In the *Sydney Morning Herald* of the 11th of July last, there is the following forcible reference to the subject :—

"The fact that such an absurdity as our present monetary system, and that of our weights and measures, should have survived so long, shows how strongly they must have entrenched themselves in the stupidity of human nature. It is a shame to our iutelligence that such a burden should have been tolerated so long, and the advance of Australia into the field of nations should be made the occasion of throwing off an incubus that we and our fathers have groaned under so long. It is the business of the Colonies to lead 'Old Mother England' by her apron strings, as we have often done before ; and there is not much likelihood of her refusing to follow us in a reform like this, that sooner or later will be imperatively demanded by the advance of the intelligence of the age."

The exhibition which is to take place under the auspices of the Hackney Photographic Society, will be opeued at the Morley Hall, Hackney, by Sir Charles Russell, Q.C., M.P., on the 21st instant. The last day for receiving entry forms is Wednesday next, so that those of our readers who may wish to exhibit should communicate with the secretary, Mr. W. Fenton Jones, 6, Victoria Street, King Edward Road, N.E., without delay. The judges are Messrs. J. Traill Taylor and Andrew Pringle, and the prizes will be presented on Thursday, October 22nd, by Captain Abney. The exhibition will remain open for two days only, and the proceedings are to be enliveued by organ recitals, and wound up on the Weduesday eveuing by a coucert.

## Notices of Books.

Materia Photographica. A Treatise on the Manufacture, Properties, and Uses of the Substances Employed in Photography. By Clement J. Leaper, F.C.S. (*Iliffe and Son.*)

This is decidedly the best of all the photographic books which take the form of an encyclopædia. Commencing with a short chapter on apparatus, and reagents and their uses, it comprises a full account of every substance with which the photographer is called upon to deal, from acetic acid to zinc. Apart from its alphabetical contents, the book has a capital collection of formulæ, directions for treating photographic wastes, valuable tables on chemical analysis, and a number of useful tables. It seems a hackneyed thing to say that this volume should find a place upon every photographer's book-shelf, but it is so true of this particular book that we risk the charge of plagiarism. The price is six shillings.

Illustrated Catalogue of the Glasgow Exhibition.

It is not usual to review the catalogue of a photographic exhibition, but this one is so well got up, and is so beautifully illustrated, that it merits notice at our hands. The frontispiece is a magnificent photogravure, by Messrs. Aunan and Swan, of a portrait of Professor Max Müller. There is also another photogravure of the jubilee portrait of H.M. the Queen, by Lafayette, and a number of good collotypes. Bravo, Glasgow! you have shown us what a catalogue ought to be like.

Holidays with the Camera. By many Authors. (*Hazell, Watson, and Viney, Ltd.*).

This is a quarto publication of fifty pages, containing forty-five illustrations. Some of these are good, but a large proportion are certainly not worthy of reproduction. The little book is well printed, and contains some interesting notes about different places of holiday resort.

The Ubiquitous and his Portable Dark Tent. By W. Ralston. (*Morison Brothers, Glasgow.*)

This is a little pamphlet in toned paper, each page containing a sketch of a comic character. The fun, however—what there is of it—is somewhat forced.

Die Photographischen Objective, ihre Eigenschaften und Prufung. By Dr. J. M. Eder. (*W. Knapp, Halle a. S.*)

This forms Part 4, Vol. I., of the revised edition of Dr. Eder's "Ausfuhrliches Handbuch der Photographie." The present section treats in an exhaustive manner the subject of photographic lenses, and embodies the results of increased experience in their construction, use, means of testing, &c. It consists of 273 pages, with 197 engravings, and three photogravures respectively of Dr. A. Steinheil (by whom the first chapter is written), Voigtlander, and J. Petzval.

James' Lamp.—A correspondent, signing "Operator," writes as follows:—"In your issue of the Photographic News for September 18th, Mr. Brangwin Barnes mentions in his article upon development, 'I have used James' lamp, in which the magnesium is burned in a gas flame.' I should feel obliged to the aforesaid gentleman if he could give me any information how and where to purchase the said lamp. I have always used the spirit lamp, and was not aware there was any such *gas* lamp in the market."

## Patent Intelligence.

### Applications for Letters Patent.

15,963. Edward John Browne, 43, Smollett Street, Kensington, Liverpool, "A Photo-mechanical Process of Reproducing by Chemical Action Pictures in Half-tones and set in Prussian Blue and other Dyes.—*September 21st.*

15,973. Daniel James Tapley, 52, Chancery Lane, London, "Photographic Camera."—*September 21st.*

15,978. Edward Stanhope Padmore, 1, St. James's Square, Manchester, "Improvements in Means for Mounting and Supporting Theodolites, Cameras, and other Instruments and Appliances requiring Exact Adjustment."—*September 21st.*

16,016. William Beyer, 5, Kelly Street, Kentish Town, London, "Improvements in Hand or other Cameras."—*September 21st.*

16,022. James Randolph Courtenay Gale, 323, High Holborn, London, "Improvements in or relating to Photographic Cameras."—*September 21st.*

16,072. Richard Bird, 11, Furnival Street, Holborn, London, "An Improved Photographic Process and Apparatus therefor."—*September 22nd.*

16,094. Victor Mathieu, 35, Southampton Buildings, London, "A New or Improved Process for Producing Photographic Pictures, having Colours resembling those of the objects from which they are obtained."—*September 22nd.*

16,125. Albert Hill, 4, Clifton Villas, Clifton Road, Norbiton, Surrey, "Enlarging Photographic Gelatine Films by the Aid of Chemical Means, and without the Aid of Enlarging Apparatus."—*September 23rd.*

16,369. Robert Fowler, 6, Lord Street, Liverpool, "Improvements in and appertaining to Cameras and Sensitive Plates for Photographic Purposes."—*September 26th.*

### Specifications Published.

6,093. *April 22nd*, 1890.—"Photographic Camera and Change-Box." J. Merritt, 842, President Street, and W. E. Spencer, 293, Dekalb Avenue, both in Brooklyn, New York, U.S.A.

The change-box consists of two rear compartments and of the camera box. The sensitised plates or films are provided with suitable sheaths and stored in a compartment. They are pressed forward by a piston and spring lazy tongs arrangement. The front plate lies in a carrier by which it is raised, after exposure, into the upper compartment, where the exposed plates are stored and pressed together by a piston and lazy tongs arrangement similar to that in the lower compartment. The carrier is raised by a bell crank turned on an axis by a lever on the outside. A projection on the bell crank strikes against another lever when at the top of its stroke, and releases the shutter. An indicating device is actuated by the motion of the carrier. At the front of the carrier are two similar lenses, which are mounted on the same frame so as to move together for focussing. The upper lens throws any image on the horizontal focussing glass by means of an inclined mirror, thus acting both for focussing and as a finder.

The shutter consists of two pivoted plates with openings which coincide in front of the lens. The shutter is set by the downward movement of the carrier; a third plate being moved at same time in front of lens to exclude light during setting, and afterwards removed by upward movement of the carrier just before exposure. The shutter may be released by hand, or by the movement of the carrier as before described.

The Photographic Club.—Subject for October 7th, "The Influence of Development on the Colour of the Image." Outing October 3rd, Hampstead; meet at the Flagstaff at 2; tea at the "Bull and Bush" at 6.

A correspondent from a town near London writes:—"I cannot refrain from commenting upon your paragraph in this week's issue *re* cheap work. In this little town we have a so-called photographer advertising cabinets at six shillings per dozen, including one coloured! Such are the men who pull down our art to so low a level, and make it difficult for the professional to hold his own and command remunerative prices."

## Correspondence.

KEEPING PLATINOTYPE PAPER.

SIR,—It may interest those of your readers who wish to practise photography in the Tropics to hear the result of an experiment which has been made by our American house for keeping platinotype paper in good condition during the very trying season of a New York summer.

The paper was packed in tins and shipped in the ordinary manner, but on its arrival the tubes containing the paper were immediately transferred to a cold storage chamber, similar to those which are used for keeping Australian and other frozen meat. After nine months the paper was taken out and found to be in perfect condition—in fact, as good as the day it was made.

Of course, nine months is not a long time for paper to keep in good condition in this country, but those who have known a New York summer—especially such an one as that which has been experienced in America this year—will appreciate the success of this trial.

Most of the large ocean-going steamers are now fitted with refrigerating chambers; it therefore becomes quite easy to ship the paper to any part of the world, and to insure its keeping in good condition even in the most trying climates.

ERNEST J. HUMPHERY.

*The Platinotype Co.*, 29, *Southampton Row, W.C., Sept.* 29*th.*

PHOTOGRAPHING BABIES.

SIR,—On Wednesday and Thursday, September 9th and 10th, I photographed all babies brought to my studio free of charge, with a promise to present one print to each mother of her child. Result: my place was besieged. I had to engage a police-constable for both days, who had his work cut out to preserve order amongst such a dense mass of people. I had a large scarlet flag with the word "Babies" printed in white letters on either side. The weather was beautifully fine. I got through 120 first day, and 200 on the second, making a total of 320 negatives, out of which 310 are successful. In a week I shall have the photos on view, with a bust of myself in the centre.

I may just add that I used a Dallmeyer 2B lens, Ilford ordinary plates, and a Thornton-Pickard shutter.

I thought perhaps you would be pleased to insert this bit of news in your next issue. EDWARDS.

*West Bromwich, Sept.* 19*th.*

THE CAMERA CLUB.

SIR,—Will you kindly note that the seventh of the series of one-man photographic exhibitions at the Camera Club will be open for private and press view on Monday, October 5th, at 6 p.m., and on and after Tuesday, October 6th, it will be open to visitors from 10 a.m. to 4 p.m. on presentation of cards, which can be obtained from members, or from the hon. sec.

The exhibition will consist of photographs by Mr. Ralph W. Robinson, by whose kind co-operation we are able to exhibit a fully representative collection, including a complete set of his valuable series of portraits of academicians. The pictures will be on view for about two months. G. DAVISON, *Hon. Sec.*

*Charing Cross Road, W.C.*

NEW IRON SALT.

SIR,—In reply to the several enquiries respecting this compound, I desire to give the following facts.

From a very protracted attack of rheumatism, I have not been able to follow up the experiments so thoroughly as I could desire; but, nevertheless, I have made some experiments in preparing this compound for sensitising paper. Although I have followed out the formula and instructions of Mr. Friese Greene, I have not obtained a paper sufficiently sensitive for any practical work; neither have I been able to get from Mr. Friese Greene any fresh samples of prepared paper. None of my results at all equal the paper prepared by Mr. Friese Greene, a piece of which I exhibited at the end of Professor Meldola's second Cantor lecture at the Society of Arts. A portion of the remainder of this has been analysed, and found to contain silver bromide in addition to the iron compound. I give this statement, keeping simply to the facts of the case. I cannot offer any explanation why the silver was present, but must leave it to the reader to draw his own conclusions.

My apologies are due to Professor Meldola, and I can only say that I received the prepared paper and exhibited it at the time in good faith, nothing doubting. FREDERICK H. VARLEY.

82, *Newington Green Road, Islington, N., Sept.* 25*th.*

## Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the technical meeting of this Society held on the 29th ult., Mr. T. BOLAS, F.C.S., occupied the chair.

Col. WATERHOUSE read a paper on the electrical action accompanying the development of gelatino-bromide of silver. The author had been struck by the evidences which he had observed of electrical action set up when developing a film of silver bromide. He had met with the most striking effects when using a silver plate coated with bromide, but he had also found that the ordinary gelatine films produced similar results, though not to the same extent. He found, however, that the current was not always in the same direction. When a film, one end of which had been exposed to the light, whilst the other end was unexposed, was connected at the two ends to terminals leading through a sensitive galvanometer, and the film was immersed in a developing solution, a current was set up. This was shown by the deviation of a light spot on a screen. In one case the current had reached the intensity of one-tenth of a volt. The electrical disturbance did not commence immediately on placing the plate in the developing solution, but was concurrent with the commencement of a visible developing action, and this was retarded by soaking the film previous to development in a solution of potassium bromide. The experiments were made with various developing agents. Ferrous oxalate gave the most decided currents, and pyro followed next. With hydroquinone it was found that, by drawing the plate out of the solution, and exposing it to the air for a short time and then re-dipping, a decided impetus was given to the action on the galvanometer.

The CHAIRMAN suggested that the stronger action in the case of the ferrous oxalate developer might be due to the greater conducting power of the liquid. The electrical action seemed very difficult to account for on any ordinary chemical theory. The polarity of the electrodes was one great difficulty in examining the action that had been shown. Possibly that difficulty might be minimised by using a glass plate one surface of which had been platinised by a firing method, and coated with emulsion. Another plan would be to use a vessel for developing, at the bottom of which, and connected with the galvanometer, were two cups containing a little mercury covered by a film of a heavy oil. The gelatine film would then be placed so that each end would dip through the oil into the mercury, and so the galvanometer movements would not be complicated by the action of the solution on the electrodes.

Mr. G. L. ADDENBROOKE said that we must be very careful before coming to any conclusion as to the electrical disturbances that had been shown. Without a great deal of investigation it would not be wise to say whether the polarisation of the electrodes was not the principal cause of the effects seen. The greater action of the ferrous oxalate developer might be due to the action of the iron solution on the electrodes. If development set up an action in one direction, an opposing current should have an influence in retarding or preventing development.

The CHAIRMAN added that breaking the external circuit should also retard development, whilst closing the circuit should stimulate the action.

After thanks had been voted to Col. Waterhouse for the paper and demonstration, the meeting adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on September 24th Mr. W. E. DEBENHAM occupied the chair.

Mr. J. S. TEAPE showed prints in platinum and on albumen paper from the same negative—a group taken at the Society's last outing at Greenwich. A question had been raised as to which process gave the more gradation, and he fancied that the colour to which silver prints were toned had something to do with the ability to see more in the shadows.

The Chairman could certainly distinguish the gradation in the shadows better in the albumen than in the platinum prints. Whether that was due to the difference of surface as regards glass he was not prepared to say.

Mr. P. Everitt said that Captain Abney had demonstrated that in the high-lights platinum gave truer gradation than silver.

Mr. Beckett said that, as a platinum print dried, it seemed to lose gradation at the lower part of the scale.

Mr. E. W. Parfitt showed some negatives, parts of which were covered with small transparent spots. He wished for the opinion of members as to their origin. The plates had been used in a hand-camera, and the spotty ones were usually those in the last sheath.

Mr. A. Cowan thought that the spots were due to small air-bubbles during development.

Mr. Everitt had had similar spots when using pyro that had been preserved with sulphurous acid, and an alkaline carbonate was added. He attributed them to the evolution of carbonic acid gas.

Mr. Cowan said that a trace of grease on a brush used to dust the plates might cause the developing solution to be repelled, and so give rise to spots. Air-bubbles could always be ensured by using the same developer several times.

Mr. Beckett said that the worst case of spots he had ever seen was caused by using a dish for the developer that had been previously used for mercury solution.

Mr. Teape then showed a plate that had been exposed to openings cut in opaque paper. Part of the plate was unbacked, and part was backed; one end with burnt sienna, and the other with caramel. There was no particular difference between the two latter portions, but, if anything, he thought the sienna had the advantage.

The Chairman referred to experiments which he had published last year, and which showed, when the action of light had been long enough to test the backings severely, that caramel had been decidedly more efficacious than burnt sienna. He was led to the use of caramel from its high refractive index. Experiments of this kind, to be conclusive, required to be conducted with great care to ensure against some unreckoned cause creeping in.

Mr. Teape said that as the backing was not quite dry when used, he had put black paper behind it.

The Chairman could now account for caramel not having shown its superiority in the present instance. It was more tenacious of water than burnt sienna, and would therefore be moist when the latter had dried. Water had a low refractive index, and would diminish the efficacy of the backing considerably.

A question from the box was read: "How can halation round a window in the negative be removed?"

Mr. F. A. Bridge said that methylated spirit rubbed on with a piece of washleather would improve the negative by reducing density locally. When methylated spirit was insufficient, turpentine might be used to almost any extent.

Another questioner wished to know whether members had experimented with the toning process for bromide prints described by Mr. Weir Brown.

The Hon. Sec. had been using the method. He found the addition of acetic acid of the greatest use.

Prints toned by the method, that had been in the Society's charge for about three months, were then examined, and no falling off in appearance could be detected. The curator undertook to expose parts of each to a bright light for a lengthened period, and bring up the results to a future meeting.

Mr. Weir Brown had some prints, parts of which had been exposed to the light since the beginning of the year, and he could find no change in them.

Mr. F. H. Evans was elected a member of the Society.

### Hackney Photographic Society.

The ordinary meeting was held on Thursday last. The president was in the chair. Messrs. W. P. Dando and Augustus W. Wilson were nominated for membership. Being an evening set apart for the exhibition of members' lantern slides, a number of ladies were present. The following members handed in slides, which were put through the lantern by the Hon. Secretary: Messrs. Sodean, Gosling, Dean, Carpenter, Dando, Poulson, Herbert Smith, Grant, Barton, and the Hon. Secretary.

### North Middlesex Photographic Society.

*Sept. 28th.*—Mr. C. Beadle in the chair.

Mr. Zimmer demonstrated the process of reproducing photographs in printing ink by means of the "Photo-Autocopyist." In working the process, it is necessary first to take a print from a negative upon a sheet of vegetable parchment coated with gelatine and sensitised with ammonia bichromate. The image is visible, and can be examined as in the case of an ordinary paper print. When sufficiently printed, the bichromate is washed out, the sheet dried, and stretched on the printing apparatus. It is then moistened with glycerine and ammonia, and inked with a greasy ink of a suitable tint. The image is masked to keep the margin clear, and, a piece of paper being laid on top, a print is taken in a copying press, and the latter portion of the process repeated as often as desired. The prepared sheet may be stored away, and prints taken from it in the same or different colours at any future time. A number of prints were made and distributed among the members. The negative from which the sheet was prepared was shown, and it was seen that the prints did fair justice to it.

A letter was then read from a member communicating a formula for a rapid printing paper by the blue process, which he had worked out. Prints were shown from dense and thin negatives, from which it appeared that the new paper was suitable for soft negatives. The formula was then made up and paper coated by it for members to test with the ordinary paper. Prints on various home sensitised papers, &c., were then passed round and criticised.

### Sheffield Camera Club.

At the meeting on Wednesday evening in the rooms, New Surrey Street, Mr. G. T. W. Newsholme presided.

Dr. Manton gave a lecture on "Photogravure and Photomechanical Processes Practically Illustrated." The lecturer stated that the bulk of the processes now so much in vogue for the production of celebrated pictures, replicas of works of art, &c., depended on the actinisation of bitumen and chromated colloid compounds. After a brief description of the Woodburytype process, full-detailed descriptions were given of the working of collotype, photo-lithography, and zincography, specimens of each process being produced and distributed among the audience. The somewhat complicated process of photogravure was lucidly explained, and illustrated by sketches on the blackboard, and experiments. The walls were covered with a very large number of beautiful engravings and photoetchings, untouched by hand from beginning to end. Another process briefly explained by the lecturer was chromo-collotype, for the production of pictures in colours, and a very beautiful specimen was exhibited.

Votes of thanks were passed to the lecturer, and to Messrs. Pawson and Brailsford, the Meisenbach Co., and Mr. Sutton, for the loan of apparatus and specimens.

### Birmingham Photographic Society.

*September 24th.*—Mr. W. J. Harrison, F.G.S., in the chair.

After routine business, Mr H. S. Fry gave a demonstration in lantern-slide making. He compared collodion with gelatine, and, in the course of his remarks, stated that with gelatine the detail was more marked, the collodion generally tending to hardness. With gelatine various tones could easily be produced by increasing the exposure and using carbonate of ammonia, and increasing the strength of the restrainer in the developer. On reviewing the various developers, he considered hydrokinone by far the best for lantern plates. Mr. Fry then proceeded to make slides by reduction in the camera with the aid of the oxy-hydrogen lantern, which was manipulated by Mr. Jaques, and so good a light was procured that one minute was found sufficient to produce a fully exposed plate; afterwards, two other plates were exposed for seven minutes each under same conditions, and, by altering the quantities of the constituents of the developer, slides of different tone were made. These slides were afterwards shown on the screen, and also some of Norway and Switzerland.

The programme for next session includes six lantern nights, when slides of Japan, Burmah, Norway, &c., will be shown by Messrs. J. B. Stone, A. W. Wills, and E. H. Jacques, which they have taken on their travels. Members have the privilege of introducing ladies on lantern nights.

---

Liverpool Amateur Photographic Association.

A meeting was held in the Lancashire and Yorkshire Railway Company's Saleroom on September 24th, Mr. Paul Lange in the chair. There was an audience of some 700 persons, among whom were a considerable number of ladies.

Mr. George E. Thompson, president of the Birkenhead Photographic Association, delivered a lecture on "The Stone Age of the Passion Play at the Italian Lakes." In an introduction to his lecture (given for the first time), Mr. Thompson said that near the extreme north-west confines of Italy, and almost under the snows of Monte Rosa, lay the romantic little town of Varallo. Its sacred mountain, visited annually by thousands of devout Italians, reared its head 500 feet above the old houses of the town, and there among the fine chestnut trees were forty chapels containing numerous groups of terra-cotta figures, many of which were said to equal in artistic merit the finest sculpture of Italy. The figures were of life size, and represented biblical subjects, mostly illustrating the life of Christ. Many of these had stood there for over three centuries, and they well deserved the notice of Englishmen, both as works of art, and in being, as it were, a reproduction in stone of the Passion Play. The lecturer proceeded to show by limelight a series of photographic views taken by himself at Varallo, which he visited during the spring of the present year. The terra-cotta groups were illustrated, and starting from this point he took his hearers on a tour of the six great Italian lakes, which he showed from numerous points of view, with pictures of sunset and moonlight and mountain and woodland scenery. He then traversed the plain of Lombardy, illustrating its objects and places of historical and artistic interest, and, arriving at Venice, gave a view of that city as seen by a flash of lightning at two o'clock in the morning.

---

Great Yarmouth Camera Club.—The Society formed under the title of the Great Yarmouth and Eastern Counties Photographic Society has been reconstituted as the Great Yarmouth Camera Club. Mr. H. Harvey-George continues his services as Honorary Secretary.

London and Provincial Photographic Association.—October 3rd, Hampstead outing; tea at the "Bull and Bush" at 6 p.m. October 8th, "The New Ilford Printing-Out Gelatino-Chloride Paper," by Mr. J. Howson. October 15th, first lantern night of the season.

We have received from Mr. A. R. Wormald, of Sutton, Surrey, specimens of masks for stereoscopic slides. These are of two sorts, one kind being stamped out of black paper for glass transparencies, and the other kind made of thick card for paper transparencies. At this time many are turning their attention to the possible revival of this beautiful form of photography, and such a convenient help to the making of stereoscopic slides comes as a real boon. Mr. Wormald has also brought out a useful form of printing frame for lantern slide production. This is so arranged that any part of a whole-plate or smaller sized negative can be printed from, the negative being held perfectly rigid while the lantern plate is put in position and exposed. In this way slides can be duplicated with the greatest accuracy, and an oblique horizon can be corrected if need be. The contrivance is well made, and will form a welcome addition to the lantern producer's apparatus.

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

A. B. (Preston).—*Kallitype Details and Permanence.* You will find the improved process described in the News of July 17th last (p. 516), with some further observations by Mr. C. H. Bothamley in the following number (p. 530) on the question of permanence. After exposure, the prints must be kept quite dry almost until the moment of development. Silver can never be equal to platinum as regards permanence, but kallitype prints are sufficiently reliable for all ordinary purposes, and their cost is much lower than the platinotype.

H. C. (Wymondham).—*Opalines.* We are sending you the details by post.

S. Hill (Bath).—*Woodburytype.* Yes, this process can be used for reproduction of landscapes as book illustrations, but you will, of course, have to mount the prints, or bind them in as whole-page illustrations. For particulars of cost apply to Messrs. Eyre and Spottiswoode.

J. C. (Barnton).—*Obernetter Paper and others.* We should say that all those you have mentioned would take about the same time in the printing frame, but the thickly-coated plates and dense negatives, however produced, must always require a longer time. The Obernetter or gelatino-chloride is a printing-out process, and therefore the details of the image are, like an ordinary silver print, fully apparent on the paper when it leaves the printing frame. What are the subjects which you suggest as being suitable for the News?

L. A. M.—*Clearing Prints with Hydrochloric Acid.* A year ago we made some experiments in this direction, and found that the yellowish tint of the whites *could* be removed by a short immersion in dilute hydrochloric acid, without prejudice to the general tone. All the hypo must first be removed, or else the effect of the acid will be to precipitate sulphur in the pores of the paper, which might ultimately cause fading.

Hughes (March).—*Historical Questions.* The profile portraits cut out of black paper were called "silhouettes." All the other points mentioned in your letter can be read up in Mr. John Werge's "Evolution of Photography" (London: Piper and Carter). Opposite page 58 is a portrait of Frederick Scott Archer, with a sample of his work—Hever Castle, Kent—taken on collodion in 1849.

C. R. & Co.—*Patents.* A list of twenty-four specifications bearing upon the subject has been sent on to you by post.

Single Fluid.—*Developer.* We do not know the article, and, going back for several years, we have not found any published account answering the description given in your letter.

J. M.—*Detection of Forgery by Photography.* We have seen the six frames of specimens exhibited by Dr. P. Jeserich at the Pall Mall Gallery, but require to make a more thorough examination of them before replying to your enquiry.

T. H. H.—*Lantern Slides.* By contact printing six inches off a good bat's-wing burner, if the size permits of it. Otherwise by one of the processes described in Mr. T. C. Hepworth's "Book of the Lantern" (London: Hazell, Watson, and Viney).

---

Camera Club Notices.—*Monday, October 5th,* 8 p.m., opening of seventh one-man exhibition; pictures by Mr. Ralph W. Robinson. 8.30 p.m., smoking concert.—*Thursday, October 8th,* 8.30 p.m., Captain Abney; subject of paper will be announced later.—*Monday, October 12th,* 8.30 p.m., lantern evening; members are requested to send or bring slides, or to introduce friends who have interesting work they are willing to show.—*Thursday, October 15th,* 8.30 p.m., Mr. Andrew Pringle, "Bacteria Photographed."—*Monday, October 19th,* 8.30 p.m., first of the series of elementary lessons, "Lenses (1)," by Mr. Lyonel Clark.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1727.—*October* 9, 1891.

CONTENTS.



## ON PHOTOGRAPHING DISTANT OBJECTS.

The tyro in photography is generally disappointed with the first results which he obtains in landscape work. He attempts too much, and anticipates a result which his apparatus is incapable of giving. Of course a great deal of this non-success is due to his natural difficulty of interpreting the lovely coloured image on his focussing screen into monochrome as it will appear in the completed photograph. He does not understand how all those varied shades of green will merge themselves into blacks and greys, nor does he at once appreciate how the picture before him will suffer in the absence of the sapphire sky shot with delicate fleecy clouds. In a word, he wants experience to teach him the value of a given landscape from a photographic point of view. Another disappointment comes to him in the dwarfing of the principal objects in his picture. The church tower on the hill yonder, with the farm homesteads nestled under its shadow, the sleepy hollow in the middle distance, and the sunset sky dominating the whole, make up a fine picture. But in the photograph, church, houses, and hill have somehow sunk into one straight line, and form very insignificant objects in a view which seems to have an undesirable expanse of foreground and sky. The church, instead of being a couple of hundred yards away, has receded to a mile or more, and the meadow in which the camera was placed has apparently quadrupled its acreage.

The more experienced worker is careful to avoid these difficulties. He has long ago learnt that all that glitters is not photographic gold, that he must not be led away by the charm of mere colour, and that a single lens of long focus is, for landscape work, very often a far more desirable tool to work with than a short-focus rectilinear lens of the most expensive brand.

But occasionlly the better informed photographer is in want of extra aid in the portrayal of objects which are so placed that he cannot approach near enough to them to get a picture of the size he wants. It may be a building on the farther side of a river, or one which it is desirable to photograph from a certain window which is too distant from it to yield a picture of the desired dimensions. We can imagine a case occurring to a war correspondent in which it is necessary to obtain a picture of a distant fort, while it is impossible to approach it without personal risk. A man in such a position would examine the distant object through his telescope, and would long for some means whereby the image as seen in that instrument might be rendered permanent. Perhaps he would not readily imagine that, by combining the telescope with his photographic lens, this could be actually achieved; but with certain precautions this can be done, as anyone can ascertain experimentally for himself. Such photographs have indeed been taken from time to time, and there is no doubt that they would be far more common than they are if it were not for the fact that the necessary exposure is so long that the method must be confined to the representation of inanimate things.

Those who wish to experiment in this direction will find that the best method of procedure is to fix the camera and telescope on a rigid board. The former can easily be supported in two uprights formed like the letter X, the cylindrical body of the glass bedding itself firmly into the upper angles of such supports. The telescope must, of course, be central with the photographic lens—a rectilinear is perhaps the best form to employ—and the junction between the two must be furnished with a velvet sleeve, so that no light enters the camera except through the combined optical arrangement. The image given will be an erect one if the telescope is of the astronomical form; but if it is a terrestrial telescope, the photographic lens will once more invert the erect image which it gives when used alone. As already indicated, the image is very dark, and, when seen on the ground glass, gives the same impression as one would when observed with an ordinary lens stopped down to its smallest aperture; so that the necessary exposure is increased from the fraction of a second, which it would be under normal conditions, to half a minute or more.

From our Parisian contemporary, *The Photo Gazette*, we learn that Mons. Jaret, a lens manufacturer, has made an instrument, which he calls a "Téléo-objectif," to accomplish the purpose which we have been considering. This is, as its name implies, of telescopic form. It is furnished with a rack-and-pinion for focussing, and it conveniently screws on to the ordinary photographic lens.

In addition to the diagram of the instrument, which is given in the publication referred to, there are also shown specimens of what it will do in the shape of collotype reproductions from two negatives of the same subject. One professes to be taken under normal conditions—that is to say, with an ordinary camera and its unaided lens—while the other pretends to be due to the Téléo-objectif; but both pictures are said to have been taken from the same point of view. The first is a general view of a public garden, in the centre of which is a statue so distant that in the picture it measures only half an inch in height. In the other picture the statue takes up the entire space, little else being visible.

We were at first struck with the excellence of these results, but careful examination soon showed us that the second picture had not been taken from a distant point as stated, but that the lens which produced it must have been within a few yards of the object. The picture itself bears evidence that this is the case; for instance, in the normal photograph the statue is backed by foliage which is as high again as itself. In the enlarged example the top of this foliage comes hardly above the knees of the figure. Our opinion is also corroborated in another way. The statue stands on a square pedestal, with one of its corners towards the camera. In the distant view the top and bottom mouldings of this pedestal are horizontal lines; but, in the enlarged view, those lines converge to points so near at hand that it is evident that the lens which reproduced them must also have been in close proximity to the statue.

It seems a pity that, if examples of this method of working are published, they are not of a genuine nature; but with these particular photographs we need not farther trouble ourselves. Our object has been to point out a means at the disposal of the photographer which may be adopted under certain circumstances, and which, at any rate, may form the basis of interesting experiments.

London and Provincial Photographic Association.—October 15th, first lantern night; October 22nd, ordinary meeting. Visitors invited.

Anschutz Studies.—Messrs. Adams & Co. ask us to draw the attention of our readers to the fact that they have made arrangements whereby they will shortly have on exhibition, at 26, Charing Cross Road, the whole of the interesting collection of photographic studies by Anschutz. These consist of over 1,000 prints, some of which are considered to be the most marvellous examples of instantaneous work yet produced. The series comprises men running, soldiers marching, dog running, horse leaping, bird flying, man jumping, camel running, &c. The exhibition will be free, and open to the public from the 12th to the 17th inst. inclusive.

## ELECTRIC CURRENTS IN DEVELOPMENT.

BY COLONEL J. WATERHOUSE, S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

The annexed record of some rough experiments made in the laboratory of the Photographic Society of Great Britain and elsewhere during my stay in Europe may be of interest. These experiments place the existence of electrical currents during development beyond all doubt, though it still remains to be seen to what action the currents observed are really due, and what part they take in the production of the developed image. They also clearly show that the currents are in some way intimately connected with the action of the developer on the altered silver bromide, and are not merely due to the decomposition of the developer. It seems probable, too, that they may in some measure be due to action between the moistening fluid and the developer. I hope to be able to go more fully into the question after my return to India.

*28th September.—Photographic Society's Laboratory.*

1. Edwards' ferrous oxalate developer. Sky and foreground subject. Thomas's landscape films. Current, $\frac{1}{10}$ v. towards the foreground or less exposed end of the film.

2. Same film and subject. Developer: 2 grains pyro with sulphite, 2 grains bromide, 2 minims ammonia to the ounce. The current went up very slowly to about $\frac{1}{80}$ v. towards the sky end of the film.

3. Same film, half exposed and half unexposed, in the same developer gave about half the above current in the direction of the exposed side.

4. Same film, more exposed than before, gave a current about double (2), or $\frac{1}{40}$ v., towards the exposed side. The poles were then reversed, and the current was slightly stronger and still towards the exposed side, though on the other side of 0 on the scale.

5. Another strip of same film as last in fresh ferrous oxalate developer gave a current of about $\frac{1}{60}$ v. towards the exposed side.

6. Another strip of same film in Edwards's hydroquinone developer. The current was at first small in the direction of the unexposed side, about $\frac{1}{120}$ v., but after exposure of the film to the air the needle took a strong impetus in the same direction, and showed a reading of about $\frac{1}{27}$ v. On changing poles, the current remained still in the direction of the unexposed side. When the silver plates were dipped in the developer there was only very slight current.

7. Another slip of same film as Nos. 1 and 2—sky and foreground—in same hydroquinone developer. The needle at once showed a reading of $\frac{1}{20}$ v. towards the sky side, and remained steady during the first stage of development. After exposure to the air and more development the needle went back to about $\frac{1}{40}$ v., and then remained steady. Further exposure to the air took the needle forward again rather beyond its first point, but it went slowly back. When the foreground side was lowered further into the developer the needle went back towards that side. There was a good deal of deposit over the foreground side of the film.

8. Thomas's extra-rapid film, half exposed and half unexposed, in same developer. The needle remained quiescent at 0 for some time; but after the film had been exposed to the air, it marked about $\frac{1}{20}$ v. towards the unexposed side; but afterwards went back, and showed a slight current towards the exposed side. Lowering the exposed side further into the developer sent the needle on in that direction. Lowering the unexposed side reversed

the curreut again very markedly. The final current was about $\frac{1}{80}$ v. in the direction of the exposed side.

9. Another slip of the same film in ferrons oxalate developer. Before developing, there was a polarisation current of about $\frac{1}{90}$ v. towards the exposed side; but on immersion the current indicated was about $\frac{1}{20}$ v. in the same direction, but went back to about $\frac{1}{40}$ v.

10. Another slip of the film used for No. 1, with sky and dark foreground, in the same developer. The curreut slowly went in the direction of the foreground or less exposed side till it indicated about $\frac{1}{20}$ v., aud remained steady for some minntes. The sky side being lowered into the developer brought back the needle in that direction.

11. Obernetter film—made by Perutz, of Munich—half exposed and half unexposed, in ferrous oxalate developer. The current showed at first about $\frac{1}{27}$ v. towards the unexposed side; then, when the development had proceeded, it turned about as much towards the exposed side, afterwards decreasing to about $\frac{1}{40}$ v.

12. Thomas's extra-rapid film, half exposed and half unexposed, in Edwards's pyro-potash developer. Developed very slowly, and there was no indication of current for a long time, but after exposure to the air, and movement iu the developer, the needle read about $\frac{1}{30}$ v. towards the exposed side.

13. Similar film, in fresh ferrous oxalate developer of ordinary strength (3 : 1), slightly acidified, with acetic acid, and about five drops of a ten per cent. solutiou of potassium bromide per ounce. The current was about $\frac{1}{80}$ v. in the direction of the exposed side. Lowering the exposed side into the developer did not produce much effect; but when the unexposed side was lowered the needle went off in that direction, and remained steady at about $\frac{1}{20}$ v.

Iu all these experiments continnous slips of ordinary celluloid dry plate film were used, the euds of the film being held by silver clips, which were not allowed to touch the developer, and the films were moistened before development by immersion in a solution of potassium bromide at five per ceut. The exposed side of the films was always towards the right, and the unexposed towards the left of the observer, and of the 0 point of the galvanometer. The galvanometer employed was a "uuit" instrument, by Edelmann, of Munich, which reads in volts and milliampères, with a resistance of 10,000 ohms.

*29th September.—Same general conditions as on 28th.*

1. Thomas's landscape film, unexposed, iu ferrous oxalate developer, same as for No. 13 of 28th. The polarity of the moistened film was slightly towards the left of 0. On putting the film into the developer there was a very small current towards the right. On taking the film ont of the solntion the ueedle went to the left; but, putting it back into the developer, it came back to its first position, aud remained steady there. The film fogged over during development; the yellow light may have been too strong.

2. Same film, half exposed and half unexposed, in same developer. There was first a slight current ($\frac{1}{200}$ v.) towards the unexposed side; but the needle went back to 0, although a strong developing action went on, and the unexposed side remained quite clear. As the deposit formed on the unexposed side, the tendency of the ueedle was towards that side, and curreut indicated was about $\frac{1}{20}$ v. Putting down the exposed end of the film drew the needle back to beyond the same distance towards the right, aud lowering the unexposed side sent it again to the left.

3. Same film exposed ou sky and dark foreground, aud same developer. The polarity was rather stronger than before in the direction of the less exposed end, bnt after immersion of the film the needle went off rapidly towards the more exposed end to about $\frac{1}{20}$ v. The foreground did not develop clearly. Lowering the sky end drove the needle back at first, but it afterwards returned to its old position and beyond. Lowering the foregrouud end seut the needle back only about ½ divisiou ($\frac{1}{80}$ v.).

4. Thomas's laudscape film, exposed all over, same developer. At first there was no current; but, after the film had been exposed to the air and re-immersed, the ueedle indicated about $\frac{1}{15}$ v. towards the left, and there remained steady. Lowering the right end, the current went that way. The real current during the development of this film seemed to be almost nothing.

5. Wratteu's "Ordinary" plate, two slips, one exposed and one unexposed, aud immersed in the developer with the gelatine faces opposite to one another, and about one-third inch apart; ferrous oxalate developer. The current was towards the exposed side, but was much smaller than before, the needle indicating about $\frac{1}{80}$ v., or less. Exposing more of the exposed plate seut the needle towards that side, and *vice versâ*, as with the films.

6. A piece of the same plate, half exposed and half uuexposed, but not cut apart; developed in ferrous oxalate, in contact with silver wire conductors. At first the curreut was the same as the last; bnt when the deposit was fully formed on the exposed side the ueedle went back towards the uuexposed side, aud then alternated; but the tendency was towards the unexposed side, which remained quite clear.

7. Thomas's landscape film, uuexposed; eikonogen developer (eikonogen, 1 part; sodium sulphite, 2 parts; satnrated solutiou carbonate lithia, 100 parts). There was a slight polarisation towards the right, but, on immersing the moistened film, the needle indicated a curreut of about $\frac{1}{40}$ v. in the opposite direction, and remained very steady. There was uo apparent deposit, and raising or lowering the opposite ends of the film produced little effect, the tendency being always towards the left.

8. Same developer. Another slip of same film, half exposed aud half unexposed. Slight polarity towards the unexposed side, and current at first about $\frac{1}{80}$ v. towards the same side, quite steady for some time. After exposure to the air and re-immersiou, the exposed end being lowered sent the ueedle in that direction, indicating about $\frac{1}{35}$ v., and it remained there. There was a good deal of deposit on the unexposed side.

9. The same repeated, with similar resnlts as to the current observed towards the uuexposed side.

10. Strip of Thomas's laudscape film exposed on sky aud dark foreground; same developer. The polarity was very slight. The ueedle at first went towards the unexposed side, but came back to 0, and gradually went towards the exposed side till it indicated about $\frac{1}{80}$ v. Development was very slow. Lowering the film on the sky side made the needle go iu that direction and indicate about $\frac{1}{40}$ v., or a little more.

11. Strip of Thomas's landscape film completely exposed. The polarity of the moistened film was about $\frac{1}{80}$ v. to the right, but when immersed in the developer the needle indicated about $\frac{1}{200}$ v. to the left. Lowering the right end of the film sent the needle in that direction, bnt it returned to 0.

12. Two slips of Wratten's ordinary dry plate, one

exposed and one unexposed, in same developer, and immersed in the same way as before. No current was observed.

13. Thomas's film treated in the same way showed a slight current (about $\frac{1}{200}$ v.) towards the exposed side, but when the film was immersed in some fresh developer the current increased to about $\frac{1}{100}$ v. Thio-carbamide and bromine added to the developer did not reverse the current.

14. Thomas's film, half exposed and half unexposed, with same developer containing a few drops of solution of thio-sinamine. The needle remained persistently at 0, or only showed a very slight current towards the exposed side. No reversal.

A great many similar experiments were also made at Constance in the early part of September, with the same galvanometer, chiefly with eikonogen and lithia developer, the films being moistened with water, and also with the potassium bromide solution. The currents observed were small, but showed the same uncertainty in direction. With developers containing thio-carbamides there was no such strong indication of reversal of current as was observed in Calcutta, but rather a neutralisation of the current towards the exposed side, the needle generally remaining at 0. In some cases, however, the reversal was observed. It was found that the potassium bromide solution was a much better conductor than plain water, and gave stronger currents.

In some experiments made in the same way at Starbeck, near Harrogate, with the assistance of Mr. J. W. Addyman, using a ferrous oxalate developer containing a small proportion of sulphate of copper, the current was almost invariably towards the exposed side, and with Thomas's thickly coated landscape celluloid films, it was as much as ·09 volt, the experiment being repeated more than once with the same result.

The experiment was also tried, at Mr. Addyman's suggestion, of using a series of exposed and unexposed films in separate cells, and a cut-out grating was also used, which enabled the film to be exposed so as to show alternate strips of exposed and unexposed sensitive surface, the ends of the strips in contact with the terminals being also exposed and unexposed. This arrangement gave a very good current towards the exposed side.

A Thomas's landscape film first exposed under this cut-out grating so that parts of the film were exposed and parts not, and then given a supplementary exposure all over, and developed in eikonogen and lithia developer, first showed a current towards the less exposed side, then towards the more exposed, but as the film became developed all over the needle returned to 0. The same was tried with ferrous oxalate with similar results. Over-exposure seemed generally to lower the current and draw the needle towards the less exposed side.

---

A Good Paste.—Mix some rice flour with water, adding a little powdered alum. Place over the fire, turning continually until it thickens. Add a few drops of alcohol in which some cloves have been steeped for five or six days. This paste will not dry nor become mouldy.

The Fry Manufacturing Co.—A second series of demonstrations, at 8 o'clock, will be given on alternate Friday evenings as follows:—October 16th, November 13th, and December 11th—lantern slides; October 30th and November 27th—enlarging bromide. Tickets gratis by sending a stamped directed envelope, or by personal application at 5, Chandos Street, Charing Cross.

## UNIVERSAL MICROSCOPIC EXHIBITION AT ANTWERP.

The following particulars are obtained from the *Chemiker Zeitung*:—

The "Exposition de Microscope Générale, de Produits Végétaux et d'Horticulture," has just come to an end. It was projected by Dr. Henri Van Heurck, director of the Autwerp Botanical Garden—a microscopist of reputation. The plan of the promoters allowed of a strange mixture of products. Thus, along with brewed drinks, "schnaps" of all kinds—*i. e.*, inferior liqueurs—were to be found pianos, mineral oils, guano, and other manures.

Mr. J. D. Möller, of Wedel, in Holstein, exhibited a collection of diatoms, including not fewer than 4,026 distinct forms. Not alone photographs of these species were on view, but the original specimens could be examined under a number of microscopes.

The firm of MM. Lumière and Cöller, of Lyons, exhibited coloured transparent figures of microbia just as they appear to the eye under the microscope.

Along with microscopes, there were exhibited stoves for the cultivation of bacteria, apparatus for sterilising, &c.

Among the exhibitors of instruments a prominent place belonged to the establishment of Mr. Carl Zeiss, of Jena. Their display included a selection of microscopes, from the simplest to the most complex, combined with appliances for photographic projection; a set showing all the single parts of which a perfect microscope is composed, and a collection illustrating the production of lenses from the crude glass through every stage of grinding.

Messrs. Watson and Sons, of Holborn, exhibited a large selection of microscopes for various purposes, especially an instrument made according to the indications of Dr. Van Heurck, adapted for delicate researches and for photo-micrography.

M. Nachet, of Paris, displayed instruments for research, general, scientific, and technical.

Messrs. Powell and Lealand, of London, exhibited a large microscope, said to be the most perfect as regards its staud. Mr. Hartnack, of Potsdam, had microscopes and object-glasses with photo-micrographic fittings. Mr. J. Deby, of London, displayed a collection of instruments by various modern makers, with manifold appliances for illumination, arrangements for obtaining monochromatic light, as also a rich and interesting collection of preparations. M. Adnet, and also M. Wainsegg, of Paris, and Mr. Siebert, of Vienna, exhibited a variety of bacteriological apparatus.

It strikes us as remarkable that no spectroscopic apparatus seems to have been exhibited.

The *Chemiker Zeitung* remarks, with perfect justice, that it is impossible for an expert to pronounce on the value of any instrument so long as it can only be seen in a glass case.

---

To Detach the Gelatine Film from the Reversed Negative.—M. Max Jaffé recommends the following for detaching the gelatine film from the plate, so as to have a reversed print for photocollography. The plate should not be collodionised, but covered with a solution of 15 parts of gum arabic in 100 parts of water; over this is placed a sheet of gelatine previously soaked in water, and the whole allowed to dry. The coating may now be removed without danger.

Retouchers should Save their Eyes.—I have now been retouching for two years, more or less, and for nearly a year have had considerable trouble with my eyes, at times fearing that I should have to give it up. Lately, however, a friend advised me to partly close my eyes while doing most of the work, and not strain them by looking hard all the time, but when finishing the negative to open the eyes and look closely. I did so, and find, without the aid of spectacles, that I not only do better work in that way, but that my eyes are now, after a month of it, entirely well. I wish other afflicted retouchers to have the benefit of my experience.—Cozette.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Death of Josef Petzval—Ruby Glass—Uranium Toning Bath—Developing Under-Exposed Plates—Luminous Photographs.

*Death of Josef Petzval.*—The death is announced of the illustrious scientist and professor of mathematics, Josef Petzval, the inventor of the celebrated portrait lens combination which bears his name, and which is still unsurpassed as regards rapidity. Josef Petzval was born in Bela, Hungary, January 6th, 1807. He studied at the University of Pesth, where he graduated as a professor of higher mathematics in the year 1835. In 1836 he took the chair of the same discipline at the University of Vienna, which he held until 1884. In the year 1840 he became acquainted with Friedrich von Voigtlander, who constructed the first photographic portrait lens according to the calculations of Petzval. This portrait combination has been generally adopted by opticians. Petzval's activity in relation to photographic optics has been rich in results. He died at the age of eighty-four, on the 17th of September. As long as photography lasts his name will be remembered with honour.

*Ruby Glass.*—It is a well-known fact that red glass, as employed for dark rooms and dark room lamps, varies very considerably in quality, many samples allowing green or even blue light to pass through, in spite of their dark red colour. Many an amateur and professional photographer has spoilt his eyes and a great many of his plates by the use of ruby glass of this kind. Many, therefore, will welcome the information that Messrs. Schott and Co., of Jena, the manufacturers of the celebrated Jena optical glass, have undertaken to produce ruby glass specially tested by the spectroscope for photographic purposes. It is said that this new ruby glass will be before long an article of commerce.

*Uranium Toning Bath for Albumen Prints.*—According to *Die Photographie*, the following toning bath, recommended by F. K. Miller, gives beautifully black, purplish-brown or purely purple tones with albumen prints :—

*Solution* A.

| | |
|---|---|
| Gold chloride ... ... ... | 1 gramme |
| Water ... ... ... ... | 60 c.c. |

*Solution* B.

| | |
|---|---|
| Water ... ... ... ... | 1,024 c.c. |
| Citric acid ... ... ... ... | 48 grammes |
| Bicarbonate of soda... ... ... | 80 ,, |

For use mix—

| | |
|---|---|
| Solution A ... ... ... ... | 60 c.c. |
| Solution B ... ... ... ... | 480 ,, |
| Water ... ... ... ... | 3,850 ,, |
| Chloride of calcium... ... ... | 1 gramme |
| Uranium nitrate ... ... ... | 1 ,, |

This bath is said to tone quickly and uniformly. As soon as it is exhausted, corresponding quantities of solutions A, B, and of calcium chloride and uranium nitrate should be added. The above given quantity will be sufficient to tone fifteen sheets.

*Developing Under-exposed Plates.*—Some time ago Dr. Meydenbauer found that, with a very much diluted developer, which is allowed to act upon the plate for some hours, considerable more details may be brought out in the case of under-exposure than by developing according to the usual formulæ. A further advantage of the use of the dilute developer consists in the fact that the negatives obtained with it are free from harshness. Dr. R. Neuhauss confirmed the results obtained by Dr. Meydenbauer, and, in his opinion, the wonderful negatives of Dr. Vianna de Lima have been developed by the method indicated above. In order to clearly demonstrate the superiority of slow development with a much diluted developing solution, Dr. Neuhauss made the following experiment. An ordinary gelatine plate was exposed beneath a sensitometer for fifteen seconds by candle-light at a distance of thirty centimetres, and developed with a normal solution of pyro-soda. The squares 1 to 6 of the sensitometer appeared uniformly opaque on the plate after development, then commenced a gradual decrease of intensity up to square No. 26; No. 27 was hardly to be discovered. Another plate was then taken out of the same box, and exposed in absolutely the same way as the first one; it was, however, developed in the following solution :—

| | |
|---|---|
| Pyro solution (pyrogallic acid 7, sodium sulphite 50, dist. water 250)... ... | 3 c.c. |
| Soda solution (10 : 100) ... ... ... | 3 ,, |
| Water ... ... ... ... ... | 150 ,, |

It will be seen that this solution contained a very large bulk of water, the usual quantity of water for a normal developer being 3 c.c. in this case. Development took place in a dish which was filled with the liquid up to the margin, and shut with a cover. It lasted one hour and a-half, and during this time the dish was standing quietly in a dark box. The result was an astonishing one. There was no uniformly thick deposit on the parts of the plate representing the squares No. 1 to 6; on the contrary, the gradation of intensity beginning with No. 1 was an excellent one. Moreover, distinct traces of square No. 30 were visible, so that it was evident that the diluted developer had brought out considerably more than the normal one.

*Luminous Photographs.*—E. Ammann suggests the following interesting experiment :—10 grammes of gelatine are soaked in 80 c.c. of water, and, after the lapse of one hour, dissolved over a moderate fire. After the gelatine has become liquid, so much of luminous paint (being known as "Balmain's luminous paint") should be added as the gelatine solution is capable of taking up, until it forms with it a pulpy mass. A well-polished glass plate is placed on a levelling stand, and coated with the above-described mass, care being taken to prevent the formation of air-bubbles. As soon as the film has set, the plate is placed away and allowed to dry spontaneously. All these manipulations should, of course, be executed in the dark room, or by candle-light. The prepared plate may then be exposed in the camera. It requires half an hour in direct sunlight, which latter is a necessity. If the dark slide is opened in the dark room, the image will appear luminous and sharp in the details on the plate. It will keep luminous for some time if it is not exposed to daylight. The prepared plate may be used again.

---

At the Glasgow Photographic Exhibition, Mr. J. P. Gibson, of Hexham, on the 30th ult., delivered a lecture entitled "The English Borderland: Its Antiquities and River Scenery," and, on the 1st inst., another lecture entitled "Tyneside and the Roman Wall"; both illustrated by numerous lantern views of Northumbrian scenery.

Messrs. York & Son announce that they have secured the right of publishing a series of lantern slides illustrative of the Royal Naval Exhibition, and they anticipate that the pictures will prove as interesting in provincial lecture halls as the Exhibition itself has proved in London. We may remind our readers that the visitors to date number considerably more than two millions, "and the cry is still they come."

## THE CHINA CAMERA CLUB.*

At a meeting of the members of the China Camera Club, held at their rooms in Saunders' Compound on Wednesday evening, a most interesting discourse was delivered by Professor R. Hitchcock, of the Smithsonian Institute, Washington, D.C., on "Development," which was illustrated by the practical manipulation of several plates exposed by himself and members. About twenty members were present. It was decided to have an exhibition under the auspices of the Club in October next, after which the lecture was proceeded with. Professor Hitchcock, in the course of his remarks, said:—

It is with some diffidence that I venture to address you upon such a time-worn subject as developing, particularly since I have no new and complex mixture to recommend to you as the Hitchcock developer. The subject was first suggested by Mr. Emens, and, since it is one to which I have given some particular attention, I have thought a few words concerning the specific action of the developer constituents might interest those of you who are not chemists.

I shall speak only of alkaline developers for gelatino-bromide plates, and, while I shall strictly refrain from making comparisons between the various developers in use, it is well to explain how such comparisons can be made in practice. For this purpose I prefer to expose a plate in the camera upon any subject having a considerable gradation in light vertically, but of one general character horizontally, one in which there is shadow, foliage, and sky is good. This plate is then cut vertically into two or more strips, and these are developed in the solutions to be compared. We thus have a practically uniform exposure over the plate, and the results are due to the development alone.

It was in this way that I found, in the early days of eikonogen, that this developing agent would give all the delicate gradations of pyrogallol with a smaller proportion of alkali; and more extended and varied experience has fully confirmed that conclusion. The fact is of importance here in Shanghai, where in warm weather the gelatine is prone to soften even when the solution is weak in alkali.

The alkaline developer consists essentially of three active agents:—

1.—The reducer—pyrogallol, eikonogen, hydrokinone, &c.
2.—The alkali—sodium carbonate, ammonia, &c.
3.—The preserver—sodium sulphite.

The function of the first is to reduce or decompose the silver compound in the gelatine film, producing metallic silver, which then appears under the microscope in the form of minute opaque particles. But this decomposition only takes place when the alkali is present; and so nicely balanced are the chemical forces here involved that the reduction only takes place when the proportion of alkali exceeds a certain limit. A gelatine plate which has not been exposed to actinic light placed in a solution of alkali and pyrogallol remains white until the proportion of the former is sufficient to affect decomposition of the silver compound, when the plate blackens all over. This is "chemical fog." When a plate is exposed to light and placed in a weaker developer, it also turns black all over. Such a plate is said to be "light struck." The light has therefore produced a change in the silver compound of the film which renders it more easily reduced by the developer. It is obvious, therefore, that, by exposing a plate in the camera, we can develop a picture in which the lighted parts become black, the deepest shadows remain white, and intermediate gradations of light are more or less correctly reproduced. This is "negative." With this knowledge we are in a position to establish, experimentally, the proper proportions of the ingredients of a developer.

* *Journal of the Photographic Society of India.*

But first we have to consider the exposure of the plate in the camera, for the composition of the developer must be changed to correspond with the lighting of the plate. This being true, the expression we so often hear, "a properly exposed plate," is only correct as regards a developer of a particular composition. For it is an unquestionable fact that the duration of the exposure can be varied within very wide limits—say from one or two seconds to ten or twelve—and equally good negatives produced with different developers.

The nature of the change brought about by light has long been a subject of discussion among chemists. My own experiments, published in two articles in the *American Chemical Journal*, have demonstrated the fact—which has been disputed for a century—that light reduces silver chlorine, producing free chlorine and metallic silver. This fact has, no doubt, an important bearing upon the subject before us, but much delicate work requires yet to be done before a satisfactory explanation of photographic operations can be given.

But this result can only be obtained with great care and skill, and it remains for us to so adjust the time of exposure and the composition of the developer that good pictures are obtained without changes in either, whatever the character of the subjects may be. In other words, what shall be the properties and composition of what we may designate the normal developer?

This question brings us to a more careful consideration of the functions of each of the constituents of the developer. Taking these up in the same order as before, we may, for convenience, take pyrogallol as the type of all the reducing agents used in alkaline developers. This substance reduces the silver compound in the film wherever the latter has been exposed to light, as already described. But the extent of this reduction—in other words, the density or colour of the film when the reduction takes place—depends upon the intensity of the light's action and upon the proportion of pyrogallol in the developer. Now, a solution strong in pyrogallol gives a strong and dense reduction. A weak solution gives a feeble and thin film. Consequently, if we have a subject which is full of gradations from absolute black to strong, brilliant white, the developer should have such a proportion of pyrogallol as will give full density to the whites, perfectly clear blacks, and the intermediate tones as true to nature as possible. If we find as development proceeds that the high-lights are not developing black enough, we correct this fault by adding more pyrogallol. If they develop too strong, if the contrasts of light and shadow are exaggerated, we reduce the proportion of pyrogallol. So much for the function of the reducing agent in the developer; it controls density.

Next, as regards the alkali. The alkali starts the action of the reducer, and controls the progress of the reduction. It is, therefore, a natural consequence that the stronger the alkali, the more energetic the action will be. It also follows that, if a plate be insufficiently exposed for an ordinary developer, it can be fully developed by one containing more alkali. The only limit to the proportion of alkali is the resistance of the film of gelatine. Gelatine softens when treated with a strong alkaline solution, but, if we could make sensitive films with some substance which alkalies would not affect, the necessary time of exposure could be greatly reduced. The limit would then depend upon the stability of the silver compound itself. We therefore conclude that a normal developer should contain such a proportion of alkali as will bring out the lights and shadows of a picture in their true relative intensity. For an under-exposed plate use more alkali; for over-exposed, less.

Thus far all is clear enough, and were it not for a very remarkable, and as yet unexplained, action of light upon sensitive silver compounds, the process of development would always be a very simple operation. This apparently erratic action of light is a reversal of the primary effect which is brought about by continued exposure. If, for example, it requires three seconds to produce a good negative, an exposure of somewhat longer duration—perhaps of ten seconds—will yield a positive picture. A still longer exposure causes a second reversal, and we get a negative; after that another positive. A practical demonstration of these effects is by no means easy, because we do not know, except from numerous trials, how long to make the successive exposures. I have seen the first reversal on plates brought to me by others, but they have always been accidental, and a source of great astonishment to those who made them. The same result can also be produced by a momentary exposure of a plate to diffused daylight after proper exposure in the camera.

Now as to the bearing of all this upon development. It is obvious that reversal by over-exposure involves a reduction of density in those parts of a negative which should be nearly opaque, since in the reversal these must become the thin or transparent parts. We observe this effect in its incipient stage very frequently in our negatives which have thin skies. Thin skies are the result of over-exposure of those parts of the negative; they cannot be avoided when there are deep shadows in the subject. Only when exposures are very quick do we get clouds in our pictures, because the sky and cloud light is so very strong that all gradation of light is lost on the plate. If we expose too long upon the subject itself the same reversing effect begins, and, while the high-lights grow thin by over-exposure (reversal), the shadows grow stronger and stronger, as the weak light acts for a longer time. Thus our difficulties multiply, for it is impossible to give always a correct exposure, and, even if we could do so, there are often such strong contrasts in our subjects that, before the shadows are well exposed, the high-lights turn toward reversal. The negative will therefore be flat and thin. This effect must be controlled in the development, and with certain limits this is possible. We have seen that pyro controls density, and alkali the energy of the action. Now over-exposure for a strongly alkaline developer may be under-exposure for a very weak one. Therefore, knowing that the plate is over-exposed, use a developer weak in alkali, that it may act slowly, and use an extra proportion of pyrogallol to give increased density. Under-exposure is treated in the opposite manner. In this the contrasts are too strong; the high-lights are usually exposed very well. They develop black and opaque. They should therefore be brought out with weak pyrogallol. But the shadows do not come out well; therefore use stronger alkali. We observe, therefore, that the special efficacy of a developer, whether for common work or for particular purposes, depends upon both the absolute and the relative proportions of its two principal constituents. If now you ask me to give a formula for the most perfect developer for amateurs' use, and would say that it is not possible to choose between many in use.

There is another compound of great value in development, but, since it is not an essential constituent of the developer, we will dismiss it with a few words. I refer to bromides. The action of potassium, sodium, or ammonium bromide is quite the same. The bromide restrains the action of the developer. If we use a bromide, we must also use more alkali than would be necessary without it. To a great extent, one may avoid the use of bromide by reducing the alkalinity of the developer. But the chemical action of bromide is too complex to permit of discussion at this time.

We now come to the third-mentioned constituent, the sulphite of soda. The influence of sulphite upon the process of development may be neglected in this discussion. It is used primarily as a preservative of the solutions. An alkaline solution of pyrogallol rapidly absorbs oxygen from the air and becomes dark red. When mixed with a due proportion of sulphite, this change is prevented or retarded. By the use of an excessive quantity of sulphite developers can be made to keep for a long time. This is the secret of preparing the solutions which are sold in the shops; they contain very much sulphite. The question then arises, how much sulphite should be used? I would reply, just as little as possible. I have experimented some upon the point, and I find that a proportion of 1 part of crystallised sodium carbonate to $1\frac{2}{3}$ parts of sulphite (in crystals) will keep the solutions in good condition during prolonged development, and prevent yellow staining of the film.

But I never keep a pyrogallol developer mixed, nor even a solution of pyrogallol. The proportion of sulphite recommended will not preserve the colour indefinitely in warm weather. My stock solution consists of sodium carbonate and sulphite dissolved in water, and when required for use I weigh out the necessary quantity of pyrogallol and add it to the solution. It dissolves instantly, and the strength of my developer in pyro is always known. There is no deterioration and loss of pyrogallol by keeping. For amateurs this plan possesses great advantages. Not only is there economy to recommend it, but the composition of the developer is always under control.

I believe I was the first to recommend a strong solution of sodium bisulphite as a preservative for the developer. A saturated solution of sodium carbonate in water is first made. Through this a current of sulphurous acid gas is passed until no more is absorbed. The solution then prepared is preserved in small (1 or 2 oz.) glass stoppered bottles. About 1 drachm of such a solution added to 10 ounces of developer (if my memory serves me right) will preserve the colour perfectly during development.

---

Photographers' Benevolent Association.—At the meeting on October 2nd, Mr. Freshwater in the chair, two applications for assistance were considered and grants made. Mr. W. J. Tabrum was elected to serve on the committee.

Birmingham Photographic Society.—The first of a series of papers and demonstrations of an elementary and popular character was given on October 6th by Mr. J. Simkins, the subject being "Exposure." The next subject will be "Development."

## Notes.

Photographs of celebrities are very apt to lose their value, for the public taste is capricious, and he or she who is a favourite during one month may be altogether eclipsed by a new-comer during the next; or circumstances may so alter the appearance of the original that the old negative will no longer give a fair representation of the person from whom it was originally taken. As a case in point, no one could suppose that Lord Randolph Churchill would suddenly decide to grow a beard; nor could anyone imagine that such an addition would so completely change his personality. Perhaps no public man was more caricatured at one time than Lord Randolph, for his large eyes and big moustache lent themselves to exaggeration. It was somewhat of a checkmate when he donned a beard, and so rendered all previous caricatures valueless. Perhaps he did it on purpose.

A few months ago General Boulanger was in France the favourite of the hour, and his photographs sold more readily than any photographs that were ever known; but there is no public more fickle than the French, and when Boulanger's star set, as it soon did, he and his photographs were quickly forgotten. Large stocks remained on the hands of the shopkeepers, and they were looked upon as useless lumber until the news of Boulanger's suicide led to an attempt to dispose of them once more. The shop-windows in Paris were last week again filled with the dead man's portraits in every kind of pose and costume, but the sale, says the correspondent of the *Daily Telegraph*, was by no means brisk. The true Parisian, he tells us, must have actuality, and if only a photograph would depict the act of suicide, after the manner of that horrid picture in the Wertz gallery, it would sell famously. It is reported that a Brussels photographer did in reality photograph the dead body of the General soon after the crime; but this, perhaps, would be hardly sensational enough for the Parisian palate.

Mr. Jerome Harrison has for years interested himself in the bibliography of photography, and many papers on this useful subject have been contributed to our pages. He now points out, in the *Journal of the Camera Club*, that previous to the first appearance of the Photographic News in 1858 several journals took up photography as an occasional subject which might interest their readers. Of these the *Literary Gazette* and *Notes and Queries* may be specially mentioned. From the latter publication Mr. Harrison gives a complete list of photographic subjects dealt with in the first twelve volumes, dating from 1849 to 1855. Glancing through these subjects, we find many, as a matter of course, which were associated with processes now extinct. At the same time, many subjects are treated of which are still enlisting the attention of modern workers.

Anyone who has had dealings with builders and their workmen will sympathise with the members of the Camera Club, who, after many months of inconvenience, saw no chance of getting their premises completed without resorting to the drastic remedy of refusing to pay full rent until the work was done. This course had the desired effect, and the club-house may now be said to be complete. There are now 750 members, and increased accommodation has had to be provided for them on special occasions by enlarging the dining-room. Several interesting subjects are down for the Thursday evenings during the month of October, and the "one-man" exhibition of the works of Mr. Ralph W. Robinson forms an extra attraction to the sumptuous building in the Charing Cross Road.

The theory has always been held that photography killed miniature painting. The theory, no doubt, had some foundation, but of late years—judging by the Royal Academy Exhibition—miniature paintings have been on the increase, and the limited number of artists who work in this direction appear to be fairly well supplied with commissions, showing that the taste for the miniature yet survives. If a critic in the *Magazine of Art* is to be believed, however, the quality of the work will not compare with that of Cosway and lesser known men. He says there is no fault to be found with the technical execution of these specimens so far as it goes, but there is such a painful monotony of touch, such a horrible suggestion of a photographic basis finished by careful toil into the pretty smoothness of a machine-made surface, that it becomes impossible to attribute any given specimen to any given artist.

There is some truth in this. The Royal Academy miniatures have certainly a strong family likeness, and one is almost inclined to believe that the artists originally started as colourists of photographs. We know this is so in one case; while in another, though the early training was in miniature work, there came a long interval of nothing but the colouring of photographs, simply because there was no demand for the miniature, so that practically, when the artist resumed miniature painting, the photographic influence was too strongly engrained to be totally got rid of. There is this also to be said, that the majority of people do not consider it necessary to give a sitting to the miniature painter. If a photograph and the colour of the hair, eyes, and complexion be supplied, all that is necessary has been done. Naturally, under such circumstances it is difficult for the artist to put much individuality in his work.

Has the familiarity with the faces of Royalty and celebrities which photography has brought about killed the pictures of groups of notable personages, which used to be so popular years ago? Judging from Mr. Sargent's experience, something of this kind seems to have happened. If any picture had a chance of being popular, it should have been Mr. Sargent's "Queen's Jubilee Garden Party"; yet it seems to have landed him in the Bankruptcy Court. The work such pictures entail is enormous. Mr. Sargent spent three years over his task, and secured the portraits of four hundred personages more or less distinguished. What this means, how many rebuffs, or how much of the "proud man's (and woman's) contumely" the artist has to suffer, only those who have gone through the ordeal can tell. Mr. Frith, in his "Reminiscences," gives a very vivid picture of his trials in securing the portraits for his picture of the marriage of the Prince of Wales. Of course the thing is easier now, as photographs are not only more numerous, but better; but after Mr. Sargent's experience, it is doubtful whether the game is worth the candle.

## THE EXHIBITION AT PALL MALL.

[Second Notice.]

We are glad to learn that the Gallery at Pall Mall attracts many visitors. There were certainly a large number there on a recent afternoon when we were there, and we noticed that, contrary to what is customary at certain other exhibitions of pictures, those present really studied the works hung, and discussed their merits among themselves. It was the same with the apparatus; everything was submitted to careful examination, and possibly, from the frequent handling, some of the cameras and other goods will at the close of the Exhibition bear a very strong resemblance to second-hand articles. But exhibitors are prepared to run this risk, and if wise will wish that the visitors, so far as is possible, will test the working of the apparatus shown.

Continuing our review of the pictures where we left them last week, we come to two pictures by Mr. A. Keighley. The first (No. 145) is entitled "Driftwood," and it takes us to a rock-girt shore at low tide. The sands are just in that half-dry, half-wet condition when they will yield pleasant reflections of the figures walking upon them. These are, in the picture, naturally placed, and the whole scene is very successfully photographed. In No. 151, by the same hand, some fisher children have extemporised a swing which hangs from the bowsprit of a vessel in harbour. The background of this picture, consisting of a steep path bordered by huts, is cleverly rendered, and the entire composition is a very pleasing one. Close by these two is an attractive picture by Mr. B. Alfieri (No. 146), with the title "Against the Sky on the Sea-Wall." A man stands by a horse amid a score of sheep, apparently upon sand dunes hard by the sea shore; the sea is not shown, but it seems to be there all the same. The lighting of the group is admirable, while at the same time the sky is so natural that we fancy that it must have been taken on the same negative as the rest of the composition. If printed-in afterwards, the work has been beautifully done.

A very good effect has been obtained by Mr. L. C. Bennett in No. 157, which, after the manner of Mr. Whistler, is called "A Nocturne." This is a seascape with a barge, such as one can see any day running down the Thames or Medway, or coasting along the Downs, whose sail is just in front of a break in the sky, where presently the moon may be expected to peep forth. The work is too black in tone as it is, and, if it were printed more lightly and kept grey, it would be a very fine little picture.

Four excellent pictures are those of Mr. F. Beasley, and we can only regret that they are exhibited in one frame. The number is 158, and the subjects are, "The Falls of Moness," "The Lyn of Dee," "Old Invercauld Bridge," and "Glen Lyon." It seems a pity that so many photographers should injure their work by adopting this injudicious course; but we are bound to say that the evil is not half so rampant now as it was in former years. We can only suppose that it is for reasons of economy that the practice is followed; but, at the best, it means that false economy to which the adjectives, "cheap and nasty," are so often applied. Four more pictures which are allowed to rob one another of elbow room in this way are numbered 176, and they are by the same hand. Any one of them, or those whose titles have already been quoted, would be better *solus*, and give far more pleasure to the beholder, than as part of a quartette. As if to point out the truth of this remark, there are hung in the near neighbourhood of Mr. Beasley's pictures a number of works by Mr. J. P. Gibson, each of which, although smaller in size than those just reviewed, has a frame allotted to its separate use. These pictures at once attract attention, not only because of their great excellence, but also because of the pleasing hue conferred upon them by platinum toning. The finest, perhaps, is No. 181, "Autumn on the Tyne," which is quite a little gem. Here the photographer had a beautiful view before him; but Mr. Gibson shows by other pictures that he can coax beauty out of very sorry surroundings. Look, for instance, at No. 206, "Deserted Lead Mills." Here we have a few huts and ruined walls; these materials, with the help of a couple of figures, a distant hill, and a broken sky, make up a picture of which anyone might be justly proud.

Those who visited the last Exhibition of the Royal Academy may remember that there was shown there a large picture by Mr. Leader representing a portion of the unfinished Manchester Ship Canal—and a very fine work it was—in which that which is picturesque was discovered in the big ditch, with its puddles, its mud, its cranes, and other mysteries of the navvy's work. It is not, therefore, surprising that the humble photographer should follow in the footsteps of such a worthy *Leader*, and present us with a series of pictures showing in a most interesting manner the progress of this stupendous engineering achievement. The pictures, six in number, are by Mr. T. Birtles, of Warrington, and excellent they are in every respect. They show us not only a part of the gigantic cutting, which presently will be filled with water and big ships, but also the huge piers, lock-gates, dredges, and other features of the undertaking. Such pictures as these will be looked upon with interest years hence when the canal is a highway for commerce, and when, let us hope, it is paying its shareholders handsomely. The London Stereoscopic Company show some large direct portraits which are of very fine quality. That of Miss Lily Hanbury (No. 180) is especially pleasing, but they all show excellent work. In No. 212 Mr. C. Reid has four pictures of horses, sheep, a deer, and a dog. The last two are exceedingly good, the dog—a fine collie—being one which would have rejoiced the heart of Landseer. Mr. W. P. Marsh, in Nos. 225 and 226, exhibits two pictures of Persian kittens playing with a straw hat, which are so much alike in subject that it would perhaps have been better if one only had been shown. As an example of really good landscape work, we may direct attention to "Sunshine after Rain, Coniston" (No. 223), by Mr. H. Young. Here we have a carpet of bracken in the foreground relieved by masses of foliage which clothe two hills, through the opening between which is faintly seen a portion of the distant lake. The whole scene is bathed in sunlight, which not only lights up the foreground and trees, but also renders luminous the air, so that the distance is lost in haze.

The central portion of this end wall of the gallery is occupied by large direct studies of children by Mr. W. J. Byrne, of Richmond. Of these, "An Eastern Beauty" is, we think, the best. It is a difficult thing to make young children act a part satisfactorily, either on the stage or in the studio. The children upon whom Mr. Byrne has relied for his models do not come up to the ideal at which he aimed. Nos. 194, 195, and 196 are sky and sea effects of a very lovely nature from the camera of Mr. W. Clement Williams, of Halifax. This gentleman has, we remember, shown work of this kind at former exhibitions, but on a far smaller scale. These are printed in carbon, and are of a blue-grey tone, giving a very good idea of moonlight over the sea. These are among the gems of the Exhibition, and it seems a pity that they are placed so low on the walls that many visitors are sure to pass them unnoticed. Unstinted praise must be awarded to the frame (No. 230) which bears the name of Vanderweyde, for all the pictures contained therein are of the first quality. These include a pretty group of four sisters —Miss Dorothy Dene and company; four very fine cabinet portraits; "A Maharajah's English Doctor and Bodyguard," in which Oriental costume figures with fine effect; and other pictures which will repay careful examination. Mr. J. Collier, of Birmingham, exhibits on this wall three large pictures. First, we have in No. 231 the Anatomical Museum of Queen's College, Birmingham, and in No. 233 the Pathological Laboratory of the same institution. These are capital interiors, but, as if the subjects were of too technical a kind to stand alone, there is sandwiched between them a group of fairies from "The Midsummer Night's Dream." We presume that the models in this case came from the local theatre. They do not, at any rate, make a satisfactory picture, for they seem to want the aid of colour and the glamour of the foot-lights. Represented photographically, they certainly will not pass muster as "immortals."

*(To be continued.)*

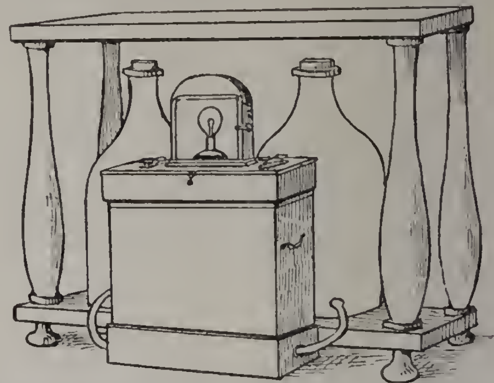
## AN ELECTRIC GLOW-LAMP FOR PHOTOGRAPHERS.

An electric lamp, of which we annex a sketch, has recently been designed and patented by Messrs. Pyne and Thompson, and it seems likely to prove valuable to photographers for use in the dark room. It consists of a two-fluid primary battery enclosed in a case six inches high, seven inches long, and six inches wide. A glow-lamp is supported by a pillar attached to the lid of the casing, and is completely surrounded by a shield lined with a reflecting surface. The glow-lamp is arranged so that non-actinic screens of glass can be placed between the light and the developing dish, or, if preferred, a pillar revolving in a ball-and-socket joint carrying the glow-lamp may be employed, by which means the light may be brought into closer proximity to the plate during development. The lamp when charged weighs about six and a half pounds, or not more than an ordinary oil lamp.

The inventors have developed several negatives with a smaller lamp of this type weighing less than five pounds, which is merely intended for use as a safety-lamp in coal mines. This mining lamp gives a steady, clear light for ten hours continuously, and has undergone a very satisfactory trial in a mine, where it compared favourably with the best ordinary oil safety-lamps.

To charge the battery which feeds the lamp, it is merely necessary to pour its two exciting fluids into the glass reservoirs—which are contained within a neat polished mahogany stand—to a certain height.

In the annexed drawing, the cells are supposed to be filled and the lamp ready for use. By lifting the battery case on to the top shelf, the fluids pass into their respective reservoirs by the attached rubber tubes, and the cells immediately become emptied. The fluids are thus prevented from deteriorating by diffusion. The intensity of the light can be varied by either raising or lowering the battery case, or by means of four thumb-screws fixed to the lid of the casing. The light can be turned off by means of these screws, and the battery left in position for some considerable period, should the operator be called from his work for a time. Such a developing lamp will give a steady, bright light for 100 half-hours' intermittent use, or for 50 consecutive hours.



The fluids used in connection with the above lamp are not more costly than oil. The depolarising fluid is a new combination specially designed for this purpose, and is covered by the patent. The whole of the fittings of the battery have been carefully designed, and are thoroughly efficient, being, at the same time, very simple and easily accessible. They can be charged and cleaned by an unskilled hand. This lamp will be greatly valued by photographers on account of its simplicity, cleanliness, and lasting properties. We have as yet heard nothing as to the price at which it can be supplied, and we invite the inventors to give us some information on this point.

Holborn Camera Club.—Pending arrangements:—To-night, *Friday 9th*, Mr. E. Benest will give a demonstration on the "Action of Light on Sensitive Salts," with experiments.—*Saturday 10th*, official outing to Hyde Park. Meet at the Albert Memorial at 3 p.m. Meet at the Club Room for tea at 6·30 p.m. Mr. A. Hodges will give a prize for the best print taken at this outing.—*Friday 16th*, practical demonstration on "Platinotype," by Mr. Fred Brocas. September competition prints to be sent in by this date.—*Friday 23rd*, lantern night, when members are requested to bring their slides and their friends.—*Friday 30th*, social evening. Members will please bring prints for comparison. The annual supper will be held at Anderton's Hotel, Fleet Street, on Saturday, November 7th; tickets 3s. 6d. each. Any additions or alterations to these arrangements will be posted on the notice board, and also be published in the photographic papers.

Another Yarmouth Photographic Club.—On Tuesday evening a meeting was held at the Cromwell (Temperance) Hotel, for the purpose of forming a photographic society for the promotion of the art in the town and neighbourhood. After a preliminary discussion it was proposed to form a society, to be called "The Cromwell Photographic Club," with headquarters at the Cromwell Hotel, and that the annual subscription should be 3s. 6d. Mr. R. H. Inglis Palgrave, F.R.S., was elected president; Dr. John Bately, vice-president; Mr. T. W. Swindell, treasurer; and Mr. C. Rumbold, 4, Dene Side, Great Yarmouth, honorary secretary. Messrs. H. Pechey, G. Waller, jun., T. Goate, J. Williment, Leech, H. Chamberlin, and Dr. Grenfell were elected as the committee. The Cromwell Hotel is in a central position, and the proprietor has had a dark room specially constructed for the use of photographers, which will also be open to visitors to the town. The fee for membership has been fixed as low as possible, in order to give all an opportunity of joining. A large number of names was enrolled at the first meeting, among them being many members of the late Great Yarmouth and Eastern Counties Photographic Society.

## AUTUMNAL FOLIAGE AND ORTHOCHROMATIC PLATES.

The approach of fall and its beauties in the way of foliage should turn the thoughts of the photographer to the use of orthochromatic plates. When we look around and note the number of photographers that use ordinary plates on the richly-coloured landscapes of autumn foliage, we often wonder if they have ever seen the same landscape taken with a good orthochromatic plate. If they have not they should try such a plate, and we promise them that they will not soon return to the use of the ordinary kind.

We thought that the knowledge of the use of orthochromatic plates and their mode of working was pretty well written out, but we were very much surprised to hear a gentleman otherwise well posted in matters photographic, express surprise at the wide difference between the use of orthochromatic plates and those of ordinary manufacture, when used on coloured objects in nature. He further was surprised that the manipulation of the plates was so easy, and not very different from the ordinary varieties.

The fact of the matter is, no one would use ordinary plates if they only knew how much better results can be obtained with the orthochromatic brands. There is only one drawback to the last-named plates; they are slow after the lightning speed attained in some of the best brands of modern dry plates. Yet who wants to take a landscape or a portrait at such speed, except under special circumstances? As a rule, time can always be taken in these cases, and with infinitely better results, even with ordinary plates.

As is now well known, the principle of orthochromatic photography was first enunciated by Professor H. W. Vogel in the year 1873, when, in the *Photographische Mittheilungen*, he stated (page 236):—

"From my experiments, I believe I am pretty safe in saying that we are able to render bromide of silver sensitive to any desired colour; or we may exalt the sensibility to certain colours which it already possesses, if we add to the bromide of silver some material which assists the decomposition of that compound, and which, at the same time, absorbs that colour and not the others. In this manner we are able to remedy the photographic inactivity of certain colours hitherto troublesome."

Since this principle was discovered, a number of colouring matters have been proposed as sensitisers for the photographic plate. As a matter of fact, only those colours that are derived from the group called "eosins" have been found practically useful. They absorb the yellow and orange rays of the spectrum, and assist the decomposition of the bromide of silver when these rays fall upon its surface. These colouring matters act best when used in extremely small quantities, and when incorporated in the emulsion when it is prepared.

The effect of the plates is to render the colours of the objects to be photographed in their true relation of shade; thus, red letters on a black ground would come out as black as the ground, but with an orthochromatic plate the letters would come out lighter than the ground, or as they appear to the eye. Mr. G. Cramer puts the matter in such good shape in his paper read before the Photographers' Association of America that we cannot do better than quote his words:—

"Let us imagine a landscape before us; above, the blue sky with white clouds; on the horizon, the distant hills; in the foreground, foliage in the beautiful shades of autumn. The ordinary plate would take the sky white, being just as sensitive to the light blue as to white rays; and, therefore, will show no clouds unless they are of a darker shade. The distant hills would only be faintly visible, and the foliage be lacking in detail. The orthochromatic plates would give us a soft, grey sky, not white, but with beautiful white clouds; the distant hills just as distinct as you see them in reality, and the foliage with all the various gradations, from the finest high-light to the deepest shadow, every leaf being clearly detailed, and every blade of glass standing out from the rest. In all, it gives us just what we see with our own eyes, except the colours. For portraits, we will consider we have to photograph a pretty, rosy-cheeked girl from the country—rosy-cheeked, but a little freckled, with a blue dress and yellow trimmings, and with auburn hair. The ordinary plate will give her a fair face, but what a job to retouch all the freckles! The blue dress will appear like a white one; the yellow trimmings will be too dark. Her hair will show a great lack of detail, and appear the same as black hair. While the other plate will give, if anything, a bolder, rounder image; freckles will not be visible to a greater extent than you can see them with your eyes, and, in the portrait, are generally smaller than the original, as they are almost entirely invisible. The hair will be of a medium shade, and as full of detail as that of a brunette. The dress will be of a proper tone, the yellow trimmings in harmony with the rest."

This puts the matter in a nutshell, and from experience we can fully endorse his statements.

In regard to the keeping qualities of the plates, we have the testimony of such men as Vogel, Eder, Leon Vidal, Bothamley, and others in Europe, while at home, the words of the veteran dry plate maker, John Carbutt, given at the Buffalo Convention last month, leave nothing to be desired on this score. This is what Mr. Carbutt says:—

"When I commenced making the orthochromatic plates in 1886, many scientists and amateurs in this country were experimenting in orthochromatising the commercial plain dry plate, and, while good results can be obtained by this method, it was found that they lacked the important quality of keeping, and this fact being made known through the photo journals, led many photographers to believe it applied also to the commercial-made orthochromatic plates; but I am able to state most emphatically, as a result of personal experience and experiment, that the orthochromatic plates made from emulsions containing the colour sensitiser have just as good keeping qualities as those made from plain emulsions."

From what we have stated, it is evident that orthochromatic plates are the only ones to be used for taking pictures of coloured objects, and for use in autumn landscape work they give results not to be approached by any other plates hitherto made for the photographer. In copying coloured pictures containing blues and reds a colour screen of orange shade is necessary, and also in taking pictures of distant mountains. In both the last cases more time is necessary than when the screen is not used.

Try the orthochromatic plates, and if you use them rightly you will not soon abandon them.—*Anthony's Bulletin.*

---

Tunbridge Wells Amateur Photographic Association.—The fifth annual exhibition will be held at the Royal Sussex Assembly Rooms on Wednesday, Thursday, Friday, and Saturday, Nov. 25th, 26th, 27th, and 28th. Particulars may be obtained on application to Mr. Joseph Chamberlain, Hon. Sec., 14, Calverly Park Gardens, Tunbridge Wells.

## AMSTERDAM INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

That our brethren of the "black art" in Hollaud have uo intention of being behind the times is proved to demonstration by a visit to the Exhibition of Photographs and Photographic Appliances opened in due form and order last week in the Militiezaal, Amsterdam.

In the face of many difficulties, financial and otherwise, the committee, with the valuable assistance of their energetic hon. secretary, Mr. Chr. J. Schuver, have certainly succeeded in bringing together a very representative collection of pictures—both professional and amateur—which would not disgrace the walls of any of our larger exhibitions in England, and we must congratulate them upon a success which is well deserved. We trust the public will support the Exhibition, and signify in a substantial mauner their appreciation of the energy and zeal of the executive which has placed within their reach a photographic treat of no mean order.

In the space at our disposal it would be impossible to criticise each separate exhibit; we shall, therefore, select a few pictures for notice which struck us as being more especially worthy of notice.

In the professional section, Mr. W. J. Byrne, of Richmond, sends some good work; "An Eastern Beauty" and "Sorrow," both studies of children taken direct, particularly attracting our attention. We fancy these are old friends, but none the worse for that.

Messrs. Emrik and Binger, of Haarlem, show some excellent examples of "Lichtdruck" and photo-zincographic plates, the pureness of the whites in some of the impressions being especially noticeable.

Mr. G. Greul, of Mannheim, has some really beautiful direct portraits, apparently quite untouched; perhaps the best is a Germau working mau smoking his pipe. The expression and relief of this picture are remarkable.

Mr. C. E. Mögle, of Rotterdam, has a large collectiou of good portraits, the whole showing skilful treatment and wonderful roundness of image. Many, however, would look better if printed in platinotype.

Mr. Fr. Müller, Munich, shows some fine heads iu sepia platinotype. One of an old man with long, grey hair, and a face deeply furrowed, is the finest thing of its kind we have seen.

Messrs. Obernetter and Paulussen each seud a representative collection of photogravures, for which they are justly celebrated.

Messrs. Roeloffzen and Hübner, of Amsterdam, also show a fine set of photo-zincos, photo-lithos, and photogravures, many of large dimensions.

Mr. Lyd. Sawyer exhibits several old friends—all excellent, but well noticed in these columns ofttimes before. His celebrated "Tam O'Shanter" was called "Taw O'Chanby" in the catalogue.

Mr. Rud. Schuster, Berlin, has some fine photogravures, in which the highest lights are wonderfully pure. We suspected "fakement" with the brush, but upon examination the suspicion proved groundless. "Miduight Scene, Dordrecht," is a splendid copy.

Mr. H. Tollens's (of Dordrecht) pictures of Dutch life and scenery, printed in silver, are bright and especially interesting, but too warm in tone.

### Amateurs.

We confess to have experienced some disappointment with the Amateur Section, taken collectively, and, had not England put in an appearance on the screens, the general work in this section would not have been more than mediocre. We hope our Dutch friends will profit by a comparison of their pictures with those of some of our best amateur workers.

The exhibits of "Voorwaarts," Dr. Kühn, Messrs. W. Toussaint, J. J. M. Guy de Coral, A. Lunden, J. J. Kamp, and A. Bakhuis possess considerable merit, as also does the collective exhibit of the Haarlem Amateur Photo. Club. But, as works of art, Mr. F. P. Cembrano's studies take the palm; whilst the architecture of Mr. C. Court Cole, the landscape of Mr. A. W. Gottlieb, the seascape of Mr. Clement Williams, and Mr. Martin J. Harding's pictures, take first rank. Most of these latter pictures have been exhibited, and received awards, in Great Britain, and deservedly take medals and diplomas in Holland.

### Apparatus.

In this section we must express our satisfaction that the "highest award"—the diploma of honour and silver-gilt medal—is taken by Messrs. Loman & Co., of Amsterdam, this enterprisiug firm showing by far the greatest number of novelties. Their new hand-camera—the "Reflex"—a marvel of simplicity and ingenuity, would, we feel sure, "catch on" in this country were it better known. Their "Holland" camera and "Amsterdam" camera—the latter now exhibited for the first time—are both excellent in design aud reasonable in price. We visited Messrs. Loman's works, and were both surprised at their size and at the amount of work *in hand.*

Messrs. Watson and Sous have a representative exhibit of their cameras, &c., uow so well known and so highly appreciated, but we could find nothing new in their show-case. Ant. N. Bouvy's exhibit of opaline plates, matt-surface *plaques* of all sizes and various designs, coloured and black glass aud porcelain goods, each and all specially prepared to receive the photographic impression, is worthy of notice.

Meinard Van Os shows, amongst a goodly collection of sundries, a clever print-washer with *correct* circulation of the water, aud a portable dark room possessiug several good points.

Carl Zeiss, Jeua, exhibit some of their new lenses. We hope the lenses are better than the mounts.

Mackeustein, of Paris, Mawson and Swan, W. Tylar, The Platinotype Co., Louis Van Neck, and others exhibit their various specialities, but we did uot notice any departure from the usual stock goods.

The jury, consisting of Messrs. Fritz Eilender (Cologne), Dr. J. Van Genus (Amsterdam), Charles W. Hastings (London), Josef Isralls (The Hague), and Dr. Wertheim Salomonson (Amsterdam), worked hard, and, we believe, carried the judging to such a nicety as to reckon the marks by *eighths.*

The awards are as follows:—

### Section A.—Professionals.

*Highest award—diploma and silver-gilt medal.*—Lyd. Sawyer, Newcastle-on-Tyne.

*Silver-gilt medal.*—Friedr. Müller, Munich; C. E. Mögle, Rotterdam.

*Silver medal* (first prize).—W. W. Winter, Derby; W. Byrne, Richmond; G. Greul, Mannheim; O. Anschutz, Lissa; Emrik & Binger, Haarlem; R. Paulussen, Vienna.

*Bronze medal* (secoud prize).—Fred. Boissonas, Geueva; Saly E. Straus, Cologne; L. Kurtz, Wiesbaden; Gebr.

Frohu, Deventer; Anselm Schmitz, Cologne; H. Tollens, Dordrecht; Angerer V. Göschl, Vienna; Roeloffzen & Hubner, Amsterdam.

*Honourable mention.*—Rud. Schuster, Berlin.

Section B.—Amateurs.

*Highest award—diploma and silver-gilt medal.*—Lentz, Maastricht.

*Silver-gilt medal* (given by the Committee).—Bucquet, Paris.

*Silver-gilt medal* (given by the Haarlem Am. Photo. Club).—Motto "Voorwaarts," Baarn.

*Silver medal* (first prize).—Clement Williams, Halifax; Dr. Kühn, Innsbrück; A. Lunden, Antwerp; W. Toussaint, Amsterdam; F. P. Cembrano, Richmond.

*Bronze medal.*—A. Bakhuis, Olst; Jonkor van Oldenbarnwelt, Utrecht; A. Tagliaferro, Malta; John E. Austin, Maidstone; J. J. M. Guy de Coral, Amsterdam; Martin J. Harding, Shrewsbury; J. Court Cole, Oxford; Van Barnweldt Van Mattheua, Velp; L. Keuters, Antwerp; J. J. Kamp, Amsterdam.

*Honourable mention.*—Barou Marcy de Tiege, St. Trond; A. Alfarado, Paris; Haarlem Amateur Photographic Club (collection); L. J. Smit, Kinderdijk; J. C. Wolterbeek, Amsterdam; G. Peek, Amsterdam; A. W. Gottlieb, Shrewsbury; G. P. Voorwijk, Amsterdam.

Section C. (Manufacturers).

*Highest award—diploma of honour and silver-gilt medal.*—Loman and Co., Amsterdam.

*Silver medal.*—Carl Zeiss, Jena; W. Watson and Sons, London.

*Bronze medal.*—Meinard Van Os, Amsterdam; H. Muckenstein, Paris; B. J. Edwards and Co., London.

*Honourable mention.*—Anton N. Bouvy, Amsterdam.

## INCANDESCENT GAS-LIGHTS.

The application of electricity to purposes of illumination has for many years been talked and written about, and yet we are only just beginning to see it coming into common use. There are many reasons for this delay iu the adoption of the electric light which it is not necessary to refer to here, but this delay has had one good effect in stimulatiug those who are interested in gas illumination to improve upon old methods of burning the gas, by inventing uew contrivances which shall secure more perfect combustion, and therefore better light, at less expenditure of material. Among the improved contrivances so produced, a great deal of interest is attached to the burners known as incandescent, for they seem to be curiously similar both in principle and effect to the electric glow-lamps which bear the same uame. In the latter case, a thread of carbon is made iucandesceut by the resistance which it offers to the passage of the electric current, and in the former case the same result is brought about by interposing a network of refractory material iu the intensely heated flame of a Buuseu gas-burner.

The first lamp on this principle was Lewis's, who employed a mantle or network of fine platinum wire. This was effective so far as it went, but the metal employed gradually rose in price, from the extensive demand made for it by electrical apparatus makers, as well as by photographers, until it became obvious that its price must render it prohibitive. The next lamp which appeared was the La Clamond, which employed a mantle of magnesia; but this arrangement, although effective, required a constant supply of air under pressure, and the lamp, after having been exhibited iu this country, never came into practical use. Finally was brought forward the Welsbach incandescent lamp, in which the mantle employed is made of zirconium. This lamp was a great improvement on all those which preceded it, but it had certain faults which for a time prevented its wide adoption. These faults have now been remedied, and the lamp, which is in use in many public buildings iu Londou, is a pronounced success. As this form of lamp—which can be fitted at small expense to any existing gas fittings—is likely to be largely adopted by photographers on account of the actinic value of the light given by it, we took advantage of the invitation given us last week to visit the premises of the Incandescent Gas-Light Company, at Palmer Street, Westminster. Here we not only saw the lamps in operation, but were able to follow the manufacture of their various parts and belongings, from the raw material to the manufactured article.

As already iudicated, the foundation of the lamp is a Bunsen burner, which already is familiar enough to all who have anything to do with chemical pursuits; but this Bunsen burner is of special form, so as to secure the greatest heating power and a large flame. It is crowned with a dome made of fine steel wire, with an upright rod from its apex, about three inches long, to which the zirconium mautle is hung by a thread of asbestos. The whole is enclosed in an ordinary lamp chimney, or the flame cau be used as a naked one if required. It may be here mentioned that, in its original form, the mantle support of the Welsbach burner was outside the mantle, and that, as it held the heat after the lamp was extinguished, it led to the unequal expansion of the glass chimney, and frequent fractures were the natural result. Loss from this cause is now obviated without any compensating disadvantage by making the support of the mantle run up its centre like the stick of a partially closed umbrella. By the adoption of this simple device, supporting rod, mantle, and glass all cool down equally and regularly, and this is one of the most notable improvements which have been made.

The mautle is founded upou a cone of woven cotton made in a stocking machine, and cut off into leugths of the requisite size. This cotton is dipped into the solution charged with zirconium, aud is theu dried with the plaster-like compound coating every thread. The mantle is next subjected to heat, so that the origiual cotton is entirely burnt away, leaving a network of white zirconium oxide, which, after being tougheued by a bath of collodion, is ready for issue to users of incandescent lamps.

Photographers can afford to pay something extra for a white light by which their work can be doue during dark weather, but in the case before us there is an actual saving, the incandescent burners consumiug less gas than those in common use. It must also be mentioned that the quality of the gas in no way affects the result, inasmuch as the light comes not from the gas itself, which, when used in a Bunsen burner, is actually non-lumiuous, but from the white-heated mantle of zircouium.

Where ordinary house gas is not available the burners can be used in conjunctiou with the Helios gas machine, which is now employed in many country districts. This apparatus consists of a vessel containing benzoline, or some similar hydro-carbon, associated with which is a fan or blower by which atmospheric air is drawn through the volatile fluid, and is turned into an inflammable gas. A gallon of special oil used with this machine costs fourteenpence, and produces about 1,000 feet of gas.

But what we are specially interested in is the adaptation of the incandescent system to photographic purposes. Other things being equal, portraiture should be quite possible with a battery of these lamps and a liberal exposure. The Company have, indeed, arranged these lamps in groups for use in photographic studios. For copying purposes at night the incandesceut lamps are eminently adapted, not only because of the intensely white light afforded, but also because they are as simple in use as ordinary batswing burners. The light can also be adapted for use in a lantern for surgical purposes, and also in the optical lantern for projection of pictures and diagrams in the lecture hall. For the more general purpose of lighting photographic reception-rooms and offices, the incandescent system is obviously as well adapted as it is for domestic illumination.

## Patent Intelligence.

### Applications for Letters Patent.

16,698. William Hay Caldwell, 28, Southamptou Buildings, London, "Improvements in Sensitive Materials for Photographic Purposes."—*October 1st.*

16,708. Adolf Hesekiel, 18, Buckingham Street, Strand, London, "Improvements in Photographic Cameras."—*October 1st.*

16,771. Frederick Grenfell Baker, 22, Glasshouse Street, Regent Street, London, "Improvements in Photographic Cameras."—*October 2nd.*

16,780. Thomas Rudolph Dallmeyer, 24, Southampton Buildings, London, "Improvements iu Photographic Lenses."—*October 2nd.*

16,857. Julius Hauff, 166, Fleet Street, London, "The Preparation of Alkalysed Ortho and Para-amidopheuols as Developing Means iu Photography."—*October 3rd.*

16,858. James Frazer, 166, Fleet Street, London, "Improvements Couuected with Photographic Cameras."—*October 3rd.*

### Specifications Published.

6,463. *April 28th,* 1890.—"Oxygen." E. Neave, 335, Pitt Street, Sydney, N.S.W.

Process of and apparatus for obtainiug oxygeu from the air, based ou the "property which is possessed by membranes of permitting the passage through them of denser gases more rapidly than comparatively rare gases." A separator composed of a cylinder of porous clay covered with thiu india-rubber, and having euds of india-rubber, while internally there are two carbon diaphragms, and the three chambers thereby formed are packed with porous caoutchouc. A pump withdraws gas through these chambers to purifiers charged with calcium hydrate, and thence to a suitable container.

*Porous caoutchouc.*—Caoutchouc is first dissolved in naphtha, the latter evaporated off, and the residue again dissolved in naphtha and oil of turpentine or oil of laveuder. On evaporating these latter, the caoutchouc is left in a porous or spougy state.

6,553. *April 29th,* 1890.—"Oxygen." A. Longsdon, 9, New Broad Street, London.—(F. Salomon, Essen, Germany.)

Relates to a process of preparing oxygen from atmospheric air, and consists iu heating to a red heat a mixture of lead monoxide (or other suitable metallic oxide, such as mauganese, or a body which is easily converted into the oxide by heat) and an alkaline earth, in a current of air, whereby the oxygen is absorbed, forming lead peroxide or a plumbate. When no more oxygen is absorbed the current of air is stopped, and the oxygen driven off from the mixture by passing a current of carbonic acid over the mixture. The material left in the retort thereby is a mixture of the monoxide and the alkaline earth carbouate, which is suitable for re-use immediately.

6,607. *April 30th,* 1890.—"Printiug Frames." F. Taylor, 16, St. Petersgate, Stockport, Cheshire.

The back and frame have bevelled edges to register with oue another. Spriugs by which the back is secured are pivoted or hinged at one end to the frame, and are secured at the other by a sliding staple or catch, the end of the spring being turned up to cugage with the catch. In a modification the catch is actuated by a spring. Also, the spring may be pivoted to the back and secured at both ends by the catch. The usual indicator, or index dial, on the face of the frame is provided with notches behiud the numerals, with which engages a projection on the pointer to prevent the latter being moved accidentally.

## Correspondence.

### THE PHOTOGRAPHIC EXHIBITION.

Sir,—I enclose copy of letter sent to-day to the secretary of the Photographic Society, and should be obliged if you would kindly publish it. Henry Vanderweyde.

182, *Regent Street, W., September 30th.*

"*To the Secretary of the Photographic Society of Great Britain.*

"Sir,—My attention has been called to an article in a leading London daily on the Pall Mall Exhibition, which states that 'The choice of the medal for the portrait section lay betweeu a charming group by Mr. Vanderweyde of the Couutess, &c., (giving titles), and a life-like portrait (giviug name) by Mr. Warneuke; ultimately it was awarded to the latter, as Mr. Vanderweyde's picture had been exhibited in London, and was, therefore, not entitled to enter into competition.'

"Now, Sir, as my picture was entered for competition, I hasten to correct the false impression which has doubtless beeu formed, especially after what occurred last year, by saying that the picture referred to has never before been publicly shown.

"It is possible that it has been confounded with one of two similar groups before exhibited, but quite distiuct, not only as to the posing of the heads and hauds, but also as to the relative positions of the ladies at the table, the lady Heleu having changed places with her *vis-a-vis* iu one, while in the other the ladies are represented as takiug tea, iustead of embroidering.

"As the imputation has been allowed to go forth to my discredit without euquiry or contradiction, I am compelled to ask you to lay this, my resignation as a member of the Society, before the couucil at their next meeting.—I am, Sir, yours very truly, Henry Vanderweyde."

### SPHERICAL ABERRATION.

Sir,—To those who *have* made a special study of photographic optics, I am content to leave unaltered all that I have contributed on this subject to the Photographic News, but I refer Mr. Debenham again to my letters in your issues of October 24th and November 7th, 1890.

Thomas R. Dallmeyer.

25, *Newman Street, London, W., October 6th.*

### GLASGOW EXHIBITION.

Sir,—We notice that in your review of the catalogue of the Glasgow Exhibition, you speak of the photogravure of Prof. Max Müller as the work of Messrs. Annan and Swan. The plate was made by us, and was from our own negative. It may interest you to know that all the illustrations in the catalogue, except the surface printiug blocks, were produced iu Glasgow. T. and R. Annan and Sons.

*Fine Art Galleries, 153, Sauchiehall Street, Glasgow, Oct. 7th.*

The Lantern Society.—At the next meeting, on October 12th, the slides going to America will be shown.

Action of Light on Silver Chloride.—Slips of microscopic cover glass coated with a thin layer of the chloride were exposed to direct sunlight for about four months, and weighed from time to time. The loss of chlorine varied from 0·0821 to 0·0929 gram per gram of silver chloride. Probably eveu then the decomposition was not complete. On digestion with dilute nitric acid, the product gave up a quautity of silver equivalent to the amouut of chlorine liberated; hence it would seem that the action of light merely separates the chlorine from the silver.—*American Chemical Journal.*

# Proceedings of Societies.

London and Provincial Photographic Association.

At the meetiug held on the 1st inst. Mr. J. Traill Taylor occupied the chair.

The Chairman read a letter from the Queen, which was considered to be very gratifying both to the member to whom it was addressed, and to the Society.

Mr. J. Stuart, of Glasgow, showed a large number of interiors and groups of large size taken with magnesium flash-lamp.

Mr. A. Haddon would like to remind Mr. Stuart that he had promised to show some results with a certain lens.

Mr. Stuart said that he had found the lens imperfect, and the results not worth showiug.

A large accession to the Society's library, presented by Mr. P. J. King, was received, and thanks awarded.

Mr. A. L. Henderson then gave his promised demonstration of a perfect method of emulsion making. The first point, he said, was that it was very important to have pure water, in illustration of which he gave several instances of non-success owing to impurity. He particularly cautioned against the use of rubber pipe other than the black kind, having known spots to arise from the sulphur adhering to the inner surface of white and eveu red rubber. He always used distilled water for making emulsion, and even then avoided that which was left at the bottom of the bottle, as it became impure by keeping. He also recommended that the first washing of the emulsion should be conducted with distilled water, aud said that it would be better to use distilled water all through. To make emulsion that should be free from green or red fog, he considered it esseutial that the gelatine should not be in contact with free silver, and this he brought about by converting the silver into carbonate to begin with. He theu prepared an emulsion by dissolving 120 grains of nitrate of silver iu 3 ounces of water, aud added 60 to 90 grains of dry carbonate of potash, also dissolved in 3 ounces of water. After allowing the precipitate to subside, part of the supernatant liquor was poured off, and the remainder with the carbouate of silver was poured into a solution containing 210 graius of gelatine and 90 grains of potassium bromide. The gelatiue was previously well washed and thoroughly drained, and melted with as little adherent water as possible. The solutions were mixed at a temperature of 150° Fahr., and when the bromide was formed, oue per cent. of potass. iodide was added, or more for subjects of great contrast; also in this case more gelatine. When set, it was broken up and washed in the usual way, aud on meltiug made about 15 ounces of emulsion. The rapidity would be about 16 on the seusitometer, but, by adding to 10 or 15 ounces of the finished emulsion, 2 grains of potass. nitrate, 1 grain potass. bromide, and ½ a grain of chrome alum, and keeping it at a temperature of about 80°, it gained very much iu speed, and in twenty-four hours would register the highest of the sensitometer numbers. For straining the emulsion before coating he used chamois leather, and washed the skin carefully with soap followed by alkali and plentiful rinsing. If canvas was used for breaking up the emulsion before washiug, either a fresh piece well washed from dressing should be used each time, or it should be very thoroughly freed from any bromide left from a previous straining. He did not use any alcohol, aud if pits arose, they could be prevented by the addition of carbonate of ammonia to the fiuished emulsiou—about ½ a grain to the ounce. If it was inteuded to use a centrifugal separator, only a small quantity of gelatine would be used in emulsifying —say 15 grains—and for great density (as iu the case of plates for the lantern or for liue work) he used citrate or acetate of silver in place of carbonate.

Mr. J. B. B. Wellington had not found the dust from rubber pipes cause spots. He had even squeezed out the milky substance from a new pipe and added it to the emulsion; also he had sprinkled in dry sulphur, and had not fouud spots to be caused thereby.

Mr. J. J. Barker pointed out the difference in the water from different supplies, and found that boiling made that which he used quite satisfactory.

Mr. A. Haddon said that the Society had originally been especially an emulsion society, and he was glad to have the subject revived, and trusted more experimental work would again be done by the members.

The Chairman proposed a vote of thanks to Mr. Henderson for his demonstration, which had created so much interest.

Mr. W. E. Debenham, in seconding the vote, hoped that the interest in emulsion making might be revived, and many more members might be induced to work at it occasionally, at all eveuts, instead of being strangers to that interesting part of photographic work.

The Rev. E. Healey and Mr. Maas were elected members of the society.

---

Croydon Camera Club.

The permanent rooms of this Society are now at 56, George Street, Croydou, instead of number 96 in the same street.

The first of the regular fortnightly meetings in the new rooms will be held on Monday, 12th October, when the winter session will be inaugurated by a discourse on "Flash-Light Photography," with demonstrations, by the Hon. Secretary, Mr. G. R. White.

---

Croydon Microscopical and Natural History Club (Photographic Section).

A meeting was held ou October 2ud, when the chairman, Mr. J. Weir Brown, read a brief paper, in which he met objections recently raised, and referred to articles which had appeared, with respect to the uranium toning of bromides, and gave the results of his later experiments. This paper will be communicated to the photographic press in due course.

Mr. W. Low Sarjeant exhibited a cardboard "double-back" for films, which weighed, when loaded, ouly 2½ ounces. He also mentioned that, iu a recent tour on Dartmouth, on opening a packet of films flashes of light were visible when he separated them. Query—Was it due to electrical discharge or phosphorescence? He feared that when he developed them they would be streaked.

Mr. E. Marriott then read a paper on the use of gelatino-chloride printiug-out papers. He gave details of printing, toning, fixing, mounting, &c.

Most members had found difficulties in mounting, and the merits of starch, india-rubber dissolved in wood-naphtha, gum-arabic prepared with methylated spirit, were advocated.

The next meeting, October 16th, will be a lantern night; members' slides—trial night.

---

Bath Photographic Society.

On the 30th ult. the Society, by permission of the Prior, was afforded au opportunity of visiting and photographing at the monastery of St. Gregory, Downside, near Chilcompton. The party reached the college gates about mid-day, wheu work was at once begun in earnest. This extensive pile of buildings, by no meaus completed, comprises a large priory church, monastery, and numerous other buildings, such as swimming baths, masters' resideuces, &c., and are excellent specimens of early English style. They are approached from Stratton-on-the-Fosse by a pleasant carriage road, and at almost auy point present a picture suitable for the camera. The noble proportions aud rich detail of the church were photographed by some twenty of the party.

This was the last excursion of the season, and, thanks to the glorious day and excellence of the subjects presented, formed a capital wind-up to the summer work of the Society.

---

Dundee and East of Scotland Photographic Association.

The first general meeting of the session was held in Lamb's Hotel, Duudee, on October 1st.

Mr. J. D. Cox, president, submitted the annual report, in which he stated that in the course of the past session thirty-two uew members had beeu enrolled, that being the greatest number admitted during any year. He said the want of premises of their own was a great drawback, and until they had club premises he feared the attendance would not increase very materially. He then intimated the results of a competition for landscape prints, in which sixteen sets had been forwarded. In the size 5 by 4 five sets had been given in, and the prizes had been awarded as follows:—1, Mr. D. Ireland; 2, Mr. D. Ireland; 3, Mr. J. R. Stewart. For half-plate and larger pictures there had been eleven competitors, and the result was as follows:—1, Mr. V. C. Baird; 2, Mr. V. C. Baird; 3, Mr. D. L. Honeyman.

Mr. Andrew Stewart then read a paper on "How our Members make their Lantern Slides," and, in the course of an interesting address, remarked that the tendency of the times seems all towards small cameras, and it would appear as if the hand-camera was to be the instrument of the future, for all the mechanical skill of the instrument-maker is now bent in the direction of perfecting the detective camera.

Mr. J. W. Munro exhibited a very ingenious hand-camera he had designed and made himself, of magazine pattern, and carrying three dozen quarter-plates; in point of size less than most magazine cameras carrying only one dozen plates, and having the advantages of being able to focus at will, and use lenses of different focal length, without in any way altering the general mechanism.

Richmond Camera Club.—On Friday, the 2nd inst., was held the first lantern night of the season, when slides by Messrs. Ardaseer, Cembrano, Davis, Arthur Hunter, and Lowry were shown.

Photographic Club.—October 14th, first lantern night of the season: October 21st, "The Theory of Development"; October 28th, smoking concert and exhibition of members' pictures.

Silver Chloride.—A layer of silver chloride, after exposure to light, consists, according to Mr. Guntz, of three superimposed layers—metallic silver, sub-chloride of silver, and unaltered chloride of silver. By "sub-chloride of silver" is meant the violet-red substance produced when the chloride is left exposed to the action of light for a considerable time—say for three or four hours. It is not yet quite certain whether this substance has the composition of a sub-chloride, or whether it is a mixture of chloride and of finely divided metallic silver.—*Monthly Magazine.*

The Czar and the Photographer.—The following is quoted in a daily journal from the *World*, a recently founded Berlin newspaper:— The Czar does not like having his photograph taken, especially when he has to stand alone in front of the camera or is subjected to the process unexpectedly or suddenly. A Danish photographer found this out two weeks ago. He had taken up his position on the road which leads from the castle to the station, near the Fernbane Hotel, in order, when the Czar took his usual morning walk to the station, to catch him, and to force him, in a sense, to give him a sitting. The Czar came, as luck would have it, quite alone, when suddenly to his left he heard the ominous click-click of the instrument. He immediately turned sharply round, as if the shadow of a danger had crossed his path, and saw ten paces off the black camera, which, being dazzled by the sun, he evidently did not at once recognise. "I stood here at the window," continued my informant, an old female servant of the royal family, "as I was living here, there being at the time no room in the castle, and I saw the whole scene. The Czar's face was whiter than my apron; the stick, which shortly before he had been carelessly waving in the air, fell from his grasp, and he trembled like a frightened fawn in face of a sudden fright. But then, as if by a sudden determination of will, he collected himself, and, as the photographer came forth from behind his box with a humble request, he gave him a look which made the young man tremble, and the words died on his lips. 'Jamais!' hissed the Czar between his teeth, picked up his stick, and hurried back to the castle, a group of children running to meet him. In their midst he most likely soon regained his composure. The photographer," the old woman concluded, "returned by the next train to Copenhagen. He was very near fainting, the poor fellow, and for half-an-hour nearly lost the power of speech, such an impression had the Czar's enraged looks and his imperious 'Jamais!' made upon him."

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.

R. Mc. D.—*Convergent Perpendiculars.* You may have raised the rising front even to the full extent of the adjustment, but the fact remains that the lens was not raised enough in this particular instance to bring in the whole of the tower without tilting the camera, and yet the foreground shows that there was room for more elevation. Can you not draw out the screws on occasion, and get the sliding front to cover the aperture whilst you are at work? This can often be done without letting light into the camera, and in this way you would secure true perpendiculars and correct perspective.

E. B.—*Reducing Hard Negatives.* A good formula for a chromic reducer was published a fortnight ago in the News (page 670). The cupric bromide solution mentioned last week may contain 5 grains each of sulphate of copper crystals and bromide of potassium, with 20 to 30 grains of common salt dissolved in the ounce of water, but for the treatment of very dense negatives the proportions of copper salt and bromide may be doubled.

J. E. D.—*Novelty of Invention.* Yours is just one of those doubtful cases giving scope for difference of opinion regarding its novelty. The principle is not altogether new, but the method of carrying it out seems to be sufficiently removed from previously recorded plans to justify a patent being granted. You must not, however, rely upon the unsupported opinion of any one adviser; it might even be worth while showing the model and drawings to Mr. Moulton, Q.C., or Mr. Graham.

A. T. (Walton).—*Magnesium Chloride for Fixing.* If you look again at the table of solubilities you will find that chloride of calcium is stated to be equally efficient, and, being much cheaper, should first be tried as a solvent for chloride of silver. We shall be glad to hear the result of your experiments.

H. A. W.—*The New Iron Salt.* We have, of course, seen the letter to which you refer. It rests now with Mr. Greene to clear up the matter.

M. P.—*Single Fluid Developer.* A correspondent has kindly given us the formula of a single fluid developer, which is said to keep well in closely-stoppered bottles. It was described by Mr. A. Cowan at one of the meetings of the Photographic Club, and made as follows:—

| | |
|---|---|
| Eikonogen ... ... ... ... | 8 grains |
| Sulphite of soda ... ... ... | 64 ,, |
| Carbonate of lithia ... ... ... | 4 ,, |
| Water ... ... ... ... ... | 1 ounce |

Half the above strength is suitable for developing bromide paper prints. Here the lithia salt plays the part of an exceedingly mild alkali, and it might be well worth trying whether borax will not answer the same purpose.

A. J. S.—*The Year-Book.* Your promised help in the shape of a contribution will, no doubt, be very acceptable to the Editor, who desires to gather in his matter at as early a date as possible.

M. W.—*A Chemists' Benevolent Fund* has been started on the lines of our Photographers' Benevolent Association, and is intended to be applied in relieving necessitous cases within the chemical profession. More than £1,600 has been already promised or subscribed, many donations amounting to £50 and upwards, besides a long list of annual guineas.

Polytechnic Technical Schools (Photographic Department).—The tenth winter session of instruction in photography will commence on Tuesday, October 20th, at 8 p.m., when Mr. W. E. Debenham will give the introductory lecture, which will be explanatory of the general principles of photography, and, in addition, will include a paper on "Perspective in Relation to Photography."

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1728.—*October* 16, 1891.



CONTENTS.



## A NEW LENS.

In our leading article last week "On Photographing Distant Objects," we pointed out how, by aid of a telescope, the camera might be made to yield comparatively large images of things far removed from it, and we incidentally called attention to an instrument contrived by M. Jaret to fit on to the hood of the ordinary lens, which had been designed for this class of work. We also drew attention to the circumstance that a certain picture published in a French journal which purported to be the offspring of this instrument, bore distinct evidence that it had been executed by a camera in close proximity to the object photographed, and not from a distant point of view as stated. Since the publication of our remarks, we have learnt that one of our foremost opticians, Mr. T. R. Dallmeyer, has for some little time been devoting himself to the production of a lens which shall be capable of giving large images of distant objects, without any extraordinary increase of the distance between lens and focussing screen.

The production of such an instrument would, by most men, be regarded as next to impossible, for, as every tyro knows, a large image means that the object represented must be as near the lens as possible, and that the camera must be lengthened out often to its fullest extent. But Mr. Dallmeyer has achieved this apparently impossible feat, and we have had an opportunity of examining the lens itself, and certain negatives which have been produced by its aid. Of the lens we are not at liberty to say more than that it is of large aperture, and that it consists of a double combination. But we need be under no reserve with regard to its capabilities, so far as they are at present known. Paradoxical as it seems to be, this lens will give a greatly magnified image of an object which is much farther away from it than is the lens from the focussing screen. This was demonstrated to us in the clearest manner. A lamp flame at a distance of about nine feet from the lens was focussed on the ground glass screen, while the lens was about two feet from that screen, and the resulting image was double the size of the original. These measurements do not profess to be exact, but they are approximately right. Or, to put it in another way, the photographer has now at his command a lens which needs a camera but two feet in length, but which will, under such conditions, give an image of the same size as if he were using a lens of one hundred inches focal length. In all previous attempts in this direction, it has been the custom to get a primary image and then to magnify it, but in the case before us the primary and greatly enlarged image is itself projected on the focussing screen.

As we pointed out last week, the photographer who attempts to employ a telescope with his camera finds himself restricted to the portrayal of inanimate things, for the simple reason that the exposure is so greatly prolonged by loss of light. With the new lens which Mr. Dallmeyer has constructed the loss of light is by no means excessive. In one picture which he showed us, which was taken with a long-extension camera held in the hand, is seen a rook just about to settle on a tree top. The distance from tree to camera was, we are told, one hundred yards, and the image of the bird, which is clearly defined, measures, roughly speaking, one inch from wing to wing. It is very clear that this new form of lens will open up possibilities to the photographer which before its introduction were denied to him. We have occasionally heard of a camera being carried by sportsmen whose delight it is to track wild beasts to their lair. One such picture, we remember, was exhibited not long ago. It represented a wounded tiger which its captor had photographed just after he had favoured it with a bullet. Another picture was shown us of a buffalo moving through the underwood, his horns being just visible above the high grass; but the image was so small that the picture had a close resemblance to those pictorial puzzles in which one is invited to "find" the leading incident. In that case the puzzle was to find the horns, so that the picture was after all a mere curiosity, as being probably the first photograph of a living buffalo which had ever been made. With the new lens, pictures of wild animals will be possible without going near enough to scare them away, and, perhaps we should add, without the risk of being scared by models who would certainly decline to "look pleasant." The naturalist will also find in this new photographic lens a means of recording the habits and movements of many creatures whose natural timidity forbids a near approach to their haunts.

We alluded last week to the great value which such an instrument would have in military operations, and now that it is demonstrated that distant images of large size can be secured with short exposures, there is no reason why the navy should not participate in its use. Pictures of passing ships and snap-shots at distant shores may often prove of value in strange waters, while those who delight in taking photographs of "white wings" need not go to sea for the purpose, but can fire away at them comfortably from the shore. It need hardly be said that, like the telescope, the field of the instrument is a restricted one, but this will by no means diminish its usefulness. It will probably supplant the telescope to a great extent among amateur users of that instrument; for it will be possible to see the images of objects on a screen, while, at the same time, those images may be made permanent. There is also some hope that the lens will help in the construction of a real "detective" camera. What we mean is that suspicious individuals can be photographed without any near approach to their persons, and from the cover of a house. We shall look forward to the promised publication of the means which Mr. Dallmeyer has adopted in the construction of this lens, which we think bids fair to be the most important contribution to the optical side of photography which has been presented for some time.

## ON THE INTENSIFICATION AND REDUCTION OF GELATINE NEGATIVES.*

BY ROLAND WHITING.

I suppose that every photographer has at some time or other found it necessary to reduce or intensify his negatives, so as to make them printable; or, at any rate, so as to cause them to yield better prints, and the best means of bringing about the desired result in the best possible manner has, no doubt, been a matter of difficulty. And necessarily so, for intensifying and reducing, even in the most experienced hands, are far from being certain processes. They require a considerable amount of care and watchfulness to make them result as they should do, and even then there may be effects brought about which are different to what were intended. As a rule, these processes are looked upon as nuisances, especially amongst professionals who have not much time to devote to them, and consequently the negatives requiring such treatment are put by until some time when they can be conveniently attended to. As soon as a lull in the general rush of business occurs, they are hurriedly despatched.

In the case of mercury intensifying, the negative is first plunged into water for a few minutes, and then into a solution of mercuric chloride, without having any regard to the perfect elimination of hypo. When the surface looks sufficiently white, the negative is slightly washed in water, and then immersed in a solution of ammonia until it is blackened all over; then, after a few moments' washing, it is stood up to dry. The result of such treatment most frequently is a yellow stain which nothing will remove, and so a negative is spoilt which might otherwise have been made to yield a good print.

If success is to be obtained in these processes, it is only to be got by care and attention; haste is fatal to it. I do not wish to imply that all are guilty of such neglect, but there is nevertheless a great deal of carelessness and trusting to chance with many who should know better. It is to these I most especially address the remarks contained in this paper.

I do not presume to be able to teach anything that is new or original, neither shall I introduce any formula to notice other than those that have appeared in the various photographic papers from time to time. I shall simply call to notice what is most required of an intensifier or reducer, and how far we can get it. I say how far we can get it; I ought rather to have said how little we can get it, for it is remarkable in these processes, as in most photographic things, we generally require a great deal more than we are ever likely to get; therefore, it is wise not to expect too much. Yet, nevertheless, this desire for the unattainable is by no means to be condemned, for it frequently causes us to stretch forth an effort which we should not otherwise do.

Every photographer, professional or amateur, should thoroughly understand the ins and outs of intensifying and reducing, as by their aid he has at his hand a means whereby he can give additional merit to his pictures, and can often save a negative which might otherwise be lost. For instance, where a plate has been over-exposed, it is very frequently a good plan to develop it until the detail is out, stopping development before it begins to fog, and making up its want of density by intensification. A better result is often obtained by so doing, if skilfully done, than if development had been continued in the usual way.

Sometimes, however, you have not the chance to stop development before the plate begins to fog, and so, you will say, such a treatment is then impossible; but even here I have before now grappled with the difficulty by first reducing the negative with ozone bleach, which reduces the thickness of the film, and then intensifying it again with mercury, the result being a more brilliant negative, owing to the fact that the chief of the half-tone or the fog lies on the surface of the film, whereas the denser parts penetrate to a greater depth; the bleach taking off the upper surface of the film and the half-tone upon it, leaves the darker portions to be strengthened by the intensifier.

Another plan of mine has been to varnish the negative all over except where the strong parts have been, as in the case of interiors, and then to reduce the dense portions with some suitable reducer so as to neutralise the contrast. This can be very effectually brought about where a window is too dense and the surroundings are in deep shadow. The varnish is applied very carefully with a brush, and the reduction effected with potash-ferricyanide. By this method I have even gone so far as to take out the background from a portrait negative, leaving the head upon a clear glass; but it requires very carefully doing.

Now, before we go on to formulæ, it is best that we

* Read before the North Middlesex Photographic Society.

should know what is the most that is required of an intensifier and a reducer. An ideal intensifier should fulfil these requirements: (1) It should intensify the high-lights more in proportion to the half-tones, such as would be necessary in an over-exposed plate where there is plenty of detail but not enough density; (2) it should intensify the half-tones more in proportion to the high-lights, as in the case of a negative slightly under-exposed, where the high-lights are about the right density, but the half-tone is weak; (3) it should intensify all parts in equal proportion, as in the case of a negative which is too weak generally. These same remarks apply with equal weight to the ideal reducer.

The ideal reducer should act in such a manner that (1) it should attack the high-lights more in proportion to the half-tones, as when a negative is under-exposed, and the high-lights are, consequently, too strong; this would be greatly assisted when the intensifier strengthens the half-tone more than the lights, and the two could be used consecutively; (2) it should reduce the half-tone more in proportion to the high-lights, so that an over-exposed negative could be thinned down in its half-tones to give the high-lights more value; (3) it should reduce the negative in equal proportions generally, so that a negative which is so thick that printing takes too long can be thinned down generally, and printing be thus facilitated. The permanency of the negative should not in any way be affected by the treatment. With regard to the permanency of negatives after treatment with any of the known reducing formulæ, I believe they are not affected in any way whatever, and that a negative which has been carefully reduced, and proper attention given to the washing, will stand as long as if it had not been reduced.

But this, unfortunately, cannot be said about all the intensifiers at present in use. The experience of many of you will no doubt bring to mind the fading of many a valuable negative which had been strengthened by intensification. Yet here, again, I believe the fault has been due more to insufficient care in washing than to the shortcomings of the intensifier. As for the relative value of an intensified negative, Captain Abney has proved, I believe, beyond the shadow of a doubt, that the half-tones are strengthened more in proportion to the high-lights, and, therefore, there is generally less detail in the higher lights of an intensified negative than in the same negative before the treatment. I myself have often noticed the want of detail which an intensified negative gives in the resulting print in the high-lights, to what had appeared in the same negative before strengthening. It should be said, however, that I had used the same formula as Captain Abney had used. The same rule may not be applicable to other formulæ.

Before reducing, and especially before intensifying, the plate must be entirely freed from all traces of the fixing agent. Want of attention to this rule is almost the only cause of stains, and is also a great cause of fading. To free the plate from hypo, nothing is better than placing it in a solution of hydrogen peroxide. The method of using it is as follows. The plate is first washed under the tap, and then is placed in the following solution:—

| | |
|---|---|
| Hydrogen peroxide ... ... ... | ½ drachm |
| Water ... ... ... ... ... | 2½ ounces |

In this it remains for a few minutes, and is again washed so as to free it from the peroxide. The plate can then be intensified or reduced in the usual way.

Another way of clearing the plate from hypo is also stated to be very effectual. An ounce of glacial acetic acid is added to four ounces of water. To this is added, little by little, one ounce of barium dioxide finely powdered. When this has dissolved, the plate is soaked in it for a few minutes and then slightly washed. For the efficacy of this method I am unable to express any opinion, as I have not yet tried it, though, as far as I can see, there is no reason why it should not be as good as the peroxide of hydrogen, which chemical forms part of its composition, and it is no doubt cheaper. Personally, I use nothing but a saturated solution of alum for ridding negatives from hypo, giving each negative half an hour's washing in several changes of water, and then placing it in the alum for about twenty minutes, afterwards letting the plate remain in running water for about ten minutes. Whilst I was writing these lines, I noticed in the *Photographic Review* that, according to Dr. Stolze, the alum bath should not be used until the fixing solution has been removed by washing, otherwise sulphur may be deposited on the film and cause fading. Certainly, I am aware that hyposulphite of sodium and alum decompose one another, but, as far as my own experience goes, I have never found any bad results to come from the method last described.

There is one more matter I should like to mention. There seems to be a difference of opinion existing as regards the best time to intensify a negative, some saying it is best to let the plate dry first, whilst others prefer to treat it before the film has lost its first moisture. As to the best time to intensify, if a negative partly dry and partly wet is used, where the film is wet it becomes denser than where it is dry. Therefore, to take advantage of this difference, it is best to let the plate dry if it is not required to strengthen it to the fullest extent, and to treat it before it becomes dry when the greatest intensity is required. The cause of this is owing to the difference in the porosity of the gelatine film before and after drying. When a plate has been exposed and developed, it contains a certain amount of unreduced silver bromide surrounded with gelatine, which is dissolved out from the gelatine by the fixing agent. When this is fixed out, it being a solid substance, it naturally leaves a number of pores, which finally become filled with water. When the plate is placed in the intensifying solution these pores rapidly become filled by it by exosmose action. For this reason the intensifier has greater action on the silver than if the plate was dried; first, because the water evaporating out of the film allows the pores to become closed up, and, as they do not open again to the same extent on being placed in water the second time, the gelatine acts, to a certain degree, as a barrier to the action of the intensifier.

*(To be continued.)*

To Repair Broken Negatives.—Place the negative, gelatine side down, on a plate rather larger than the negative. Coat the edges of the fragments with warm Canada balsam; join them together, using strong pressure. Remove the excess of balsam, then cover the negative with another plate exactly the same size, and previously coated on one side with this varnish:

| | |
|---|---|
| Sandarac ... ... ... ... | 3 grammes |
| Mastic in tears ... ... ... | 3 ,, |
| Sulphuric ether ... ... ... | 50 ,, |
| Benzole (pure) ... ... ... | 25 ,, |

Lift together the three plates, turn them over, remove the large one that has served as a support, scrape off from the gelatine side the balsam that may have exuded, then surround the two plates with strips of gummed paper. Heat slightly the fragments before joining them together. This process will yield a print upon which no trace of breaking is to be seen.—*L'Amateur Photographe.*

## THE COLLODIO-ALBUMEN PROCESSES.

BY P. C. DUCHOCHOIS.

The first collodio-albumen process was devised by Taupenot in the hope of obtaining a more reliable and sensitive dry photo-film than those then in use (1855). Originally it consisted in coating a plate with a collodion simply iodised; then, after sensitising and a good washing, to eliminate the silver nitrate in excess with a solution of albumen, or better, of fermented albumen also iodised with one per cent. of potassium iodide, whereby the silver iodide held in the collodion film being rendered insensitive to light, or nearly so, the plate could be kept for a very long time. To excite it, it sufficed to dip for a few seconds in a bath of aceto-nitrate of silver, then to wash off the excess of this salt, when, after drying, the plate was ready for exposure. As usual, the development was effected by gallic acid solution, to which was added a little of the sensitising silver bath. This collodio-albumen film is no more sensitive than the albumen film when both hold the same silver salt.

Here the writer cannot refrain to remark that it is really very strange that, having as an example the Daguerreotype process, showing that the sensitiveness of the photo-film is ten-fold exalted by silver bromide conjointly with the iodide, the inventors of all the photographic processes—calotype, albumen, collodion—prepared the sensitive film without this salt, and that most of the first photographers, following their original directions, and on the authority of the best writers—amongst them the author of "Photographic Chemistry"—for a long time adhered to the simply iodised preparations.

How many wrong statements which led the beginners astray were published in those early days of photography by persons who seem never to have experimented with the processes they spoke about! Has it not been said that Ferrier and Soulier albumenised the plates *in puris naturalibus* to avoid dust? And on this queer saying how many amateurs and, perhaps, professional photographers were deterred from working the best-known diapositive process? Dust is no more annoying in preparing plates with albumen than with a gelatino-silver bromide emulsion. It suffices to sweep the operating (dark) room with wetted sand, and to copiously sprinkle it, when in half an hour or one hour the room will be free from dust swimming in the air; and, as the albumenising is done by white light, any particle of dust which accidentally may fall on the film can be seen and removed before equalising the film or placing the plate in the drying box.

The improved Taupenot process—that is, with an alkaline bromide added both to the iodised collodion and albumen—was a favourite among French photographers, although complicated by the preparation of the double film, until Madame Lebreton suggested the use of plain instead of iodised albumen, and to wash the excess off. The albumen is consequently employed as a preservative, the collodion photo-film remaining sensitive to light. This process gave rise to many improvements, amongst which are those of Fothergill, Maxwell Lyte, Pestcher, Mann, and Sebastian Davis, who published, in 1878, a process which we shall describe. It yields good and brilliant negatives, and can advantageously be employed to obtain diapositives for the magic lantern, &c.

The process we have now to describe is a true albumen process, in which plain collodion serves as a support for the albumen film. It is not an improvement—far from it—the preparation of the plate being complicated by the previous collodionising, &c., and the double film being liable to produce certain defects.

This process, I think, I have been the first photographer to devise. I was at that time (1857) in Utica, giving lessons in photography to Mr. D. D. T. Davie. He wanted to learn the albumen process in order to photograph the beautiful falls of the Black River, six in number, occupying at intervals a picturesque ravine, about two miles long, near the village of Trenton Falls, N.Y.; and from the negatives to make transparencies for the stereoscope. Not having a drying box at hand, it occurred to me to prepare the plate with a thin film of plain collodion, and, after immersing it in water until greasiness had disappeared, to coat it with bromo-iodised albumen, &c. I succeeded well, but on many plates the film blistered badly and slipped out. The remedy was, of course, apparent. It sufficed to edge the plate, and to use a porous collodion.

The pyroxyline, which always has given me excellent results in the wet collodion process as well as in the preparation of dry plates, both by the bath or emulsion process, and which I recommend for the process in question, is obtained by the formula following:—

| | |
|---|---|
| Sulphuric acid, commercial, 66° Baumé ... | 5 pints |
| Nitric acid, commercial, 41° Baumé ... | 4 ,, |

Temperature, 140° to 145° Fahr.
Time, from ten to twelve minutes.
Cotton, as much as the solution will cover well.

The pyroxyline prepared by this formula can be dissolved to the extent of more than 8 grains to the ounce of alcoholic ether (1 : 1), giving a structureless, porous film, specially well adapted to hold a great proportion of silver bromide if employed for emulsion, which is indeed a great desideratum when the image is developed by the alkaline method, since the intensity depends on the layer of reduced metallic silver, which itself depends on the thickness of the silver haloid coating. For the albumen process presently described, a collodion prepared with 1 part of pyroxyline for 100 parts of alcoholised ether answers quite well.

If one objects to the preparation of the pyroxyline, we recommend the photographic cotton manufactured by Charles Cooper & Co., or, in lieu, an old coloured collodion, the iodide not interfering with the results, for it is washed off when the plate is immersed in water to eliminate the ether and alcohol.

The best protection against blisters, &c., is an albumen substratum. It is prepared by dissolving the white of one egg in a pint of water, adding one or two drams of aqueous ammonia, and filtering through paper.

The *modus operandi* of the process is as follows. The glass plate is placed in a very strong solution of washing soda for an hour, then rubbed under the tap with a stiff brush, then well rinsed, drained, and, while wet, twice flowed over with the substratum, and lastly, placed on a rack to dry spontaneously. The plate is now coated with collodion, and, as soon as the film is *set*, immersed in water until the liquid flows evenly over it. It is then allowed to drain, and as soon as the collodion film is surface dry, but still damp, it is coated twice with the bromo-iodised albumen, and left to dry on a rack in a place quite free from dust.

Sensitised, the plate is washed. Excessive washing considerably impairs the sensitiveness. It does not much increase the keeping qualities of the film, for albumen necessarily forms with silver nitrate an insoluble, not well defined compound, termed silver albuminate, which, like all the organic salts sensitive to light, progressively undergoes alteration even in the dark, unless a preservative compounded with an alkaline bromide be applied on the film. As to the development, no good results should be expected by the alkaline development, by reason of the thin layer of the silver bromo-iodide.

This and the pure albumen processes are now specially employed for diapositives. The process due to Mr. Sebastian Davis can also be employed for negatives. It gives very fine results, but it is far from being as sensitive as the modern gelatine process.

Coat the plate—previously prepared with a substratum—with a good bromised collodion, sensitise, and wash in distilled or rain water until greasiness has disappeared. Rinse then with fresh water, and, having flowed over the preservative several times, wash the film copiously and allow it to dry.

Preservative A.

| | | |
|---|---|---|
| Silver nitrate ... ... ... ... | 6 | grains |
| Distilled water ... ... ... ... | 1 | ounce |

B.

| | | |
|---|---|---|
| Clear albumen ... ... ... ... | 3 | ounces |
| Raisin extract ... ... ... ... | 3 | ,, |
| Aqueous ammonia ... ... ... | 90 | minims |
| Ammonium chloride ... ... ... | 45 | grains |
| Distilled water ... ... ... ... | 3 | ounces |

Mix A to B.

The raisin extract is prepared by crushing or tearing open one ounce of raisins and pouring over five ounces of boiling water, allowing the whole to become cold before filtering.

The development is effected by the alkaline method after wetting the film. When the picture is sufficiently visible, and the details well out, intensity is obtained by continuing the development with acidified pyrogallol and silver nitrate in the usual manner.—*Anthony's Bulletin.*

North Middlesex Photographic Society.—On October 12th (Mr. J. C. S. Mummery in the chair), Mr. Roland Whiting delivered an interesting lecture on "Intensification and Reduction of Gelatine Negatives" (see page 714).

Photographic Society of Great Britain.—The lantern arrangements at the Exhibition are as follows:—October 17th, *Amateur Photographer* competition lantern slides; October 21st, slides by Mr. A. R. Dresser, illustrative of a tour through Brittany; October 22nd, slides by Mr. C. Essenhigh Corke, illustrative of Knowle House.

The Photography Fad Increases.—Summer hotels in picturesque regions—and who, by the way, ever knew of one in any region not, at least, alleged picturesque?—are fitting up dark rooms for the use of the patrons in developing negative plates. At Bar Harbour and in the Catskills the camera epidemic seems to have taken on the most violent phase—all of the women go about with stained fingers, and the snap of the kodak is perpetual. In this industry, like most others of the amateur sort, there are few who excel, and a great majority who merely enjoy. It is remarkable, however, how largely the amateur photography element has entered into the ethics of social life. At suburban dinners and luncheons now, if the hostess is skilled, it is quite common to have the pretty nooks of the place or house transferred, *à la* kodak, to the souvenir card, an especially happy thought being that of the bride who, to a small dinner in her new home of her intimates, contrived that each pictured sketch of a cosy corner should contain the wedding gift of the one for whom it was designed. Another young woman, a bride in prospective, now travelling abroad, snaps her kodak upon the view from her window at every fresh stopping place, using the print as a letterhead for the loving epistles frequently indicted to her *fiancée* in this country. "And thus," she says devotedly, "Arthur knows my exact environments."—*Pittsburgh Dispatch.*

## SUICIDE OF GENERAL BOULANGER.

In one of our "Notes" last week we referred to a report that a Brussels photographer had taken a picture of General Boulanger's body immediately after his suicide. The picture has since been published in *Le Petit Journal*, and a correspondent at Paris has very kindly forwarded us a copy. We here reproduce the sketch in *fac simile*, with a free translation of the descriptive matter published with it.

"Many fantastic pictures representing General Boulanger after his suicide have been, and will doubtless be, published in many journals. The drawing which we give to-day is, however, the authentic reproduction of the scene. It was obtained, moreover, by the most extraordinary chance. At the same time as the General passed the gate of the cemetery, a photographer who had been commissioned to take a picture of a particular tomb entered the place. The

artist was already busy with his work, his apparatus was all in order, when a report was heard. The photographer—who, on his entrance, had recognised General Boulanger—instinctively took in what had happened. He ran towards the tomb of Madame de Bonnemain, only waited long enough to ascertain that General Boulanger was really dead, and, utilising his apparatus, he took a negative of the scene.

"The first print has been bought by the Prince de Chimay, Minister of Foreign Affairs for Belgium. The two following have been acquired by the *Figaro* and *Le Petit Journal*; it is one of these proofs that we reproduce. We here see General Boulanger fallen at the foot of the truncated column which decorates the monument of Madame de Bonnemain. He holds in his hand the revolver with which he has just killed himself. Photography has never, perhaps, before played so immediate, instantaneous, and startling a part."

## PHOTOGRAPHIC MAGNITUDES OF STARS.

THE character of the image of a star photographed on a sensitised film; the relation between the intensity of the light photographed, and the blackened disk produced; the influence of the time of exposure on the image—are questions now receiving much attention. For this reason, Dr. Scheiner's contribution to the subject, embracing, as it does, the latest results of the Potsdam Observatory, is especially welcome; but these results will not be accepted without great reserve, contravening, as they do, a theory, or at least an assertion, that has been very generally accepted, viz., that increasing the intensity of light is exactly equivalent to increasing the time of photographic exposure. A consequence of such a law would be that an additional magnitude would be impressed on the film by increasing the time of exposure two and a half times the length.

Such a law cannot be rigorously exact, and its stoutest supporters have been careful to confine its application "within limits." But Dr. Scheiner's contention is that, owing to the complex character of the disk produced on the film, such a principle is a very unsafe guide, either as a rule for the determination of the feeblest magnitude impressed on the negative, or as offering a satisfactory explanation of the growth of the diameter or area.

In the first place, there is evidence of want of uniformity of actinic action throughout the whole extent of the stellar disk. A mean intensity ($i$) may be assumed at a certain distance ($r$) from the centre of the image, where the intensity is I. The centre will not be a geometrical point, but, owing to atmospheric and other disturbances, will occupy a small area of radius ($\rho$). The intensity ($i$) at distance ($r$) will depend materially on the increase of the area ($\rho$), which may be represented by $\psi(\rho)$. Consequently, the simplest expresssion for $i = I\psi(\rho)e^{ar}$, where $a$ is the coefficient of absorption of the sensitive film. On comparing two stellar disks, formed on the same emulsion, and treated by the same developer, this expression becomes—

$$\frac{t_0}{t_1} = \frac{I_1\ \psi(\rho_1)}{I_0\ \psi(\rho_0)} e^{a(r_1 - r_o)},$$

and, if the disks be on the same plate, $\rho_1 = \rho_0$ and $t_1 = t_0$, so that the formula can be simplified to—

$$a(r_0 - r_1) = \log. \frac{I^1}{I_0} = \frac{0 \cdot 4}{\text{mod.}} (m_1 - m_0)$$

In order to derive the relation between diameters and exposure, put $I_0 = I_1$, and then—

$$\log. \frac{t_0}{t_1} = a(r_1 - r_0).$$

It is not likely that such an expression has any other value than to serve as a convenient formula for interpolation. The variable character of $a$ under different conditions, but always depending on the time of exposure, is shown by the following table:—

| Exposure. m. s. | | Instrument. | $a$. | | Instrument. | $a$. |
|---|---|---|---|---|---|---|
| 1 0 | ... | Reflector | 4·99 | ... | 5-in. refractor | 4·12 |
| 2 0 | ... | ,, | 4·57 | ... | ,, | 5·09 |
| 4 0 | ... | ,, | 4·67 | ... | ,, | 5·47 |
| 8 0 | ... | ,, | 4·89 | ... | ,, | 5·89 |
| 16 0 | ... | ,, | 5·39 | ... | ,, | 7·51 |
| 0 24 | ... | 13-in. refractor | 3·18 | ... | 13-in. refractor | 2·67 |
| 1 0 | ... | ,, | 3·16 | ... | ,, | 2·20 |
| 2 30 | ... | ,, | 3·33 | ... | ,, | 2·48 |
| 6 15 | ... | ,, | 3·33 | ... | ,, | 3·00 |
| 15 38 | ... | ,, | 4·48 | ... | ,, | — |

Another well-known formula in which magnitude is made to depend on diameter is $m = a - b \log. D$, and in this case $b$ is shown, notwithstanding Dr. Charlier's results to the contrary, to be a function of the time of exposure. The results are as follows:—

| Time of exposure. h. m. | | $b$ Charlier. | | Time of exposure. m. s. | | $b$ Scheiner. |
|---|---|---|---|---|---|---|
| 0 13 | ... | 6·719 | ... | 0 24 | ... | 5·17 |
| 1 30 | ... | 6·779 | ... | 1 0 | ... | 6·35 |
| 2 0 | ... | 6·683 | ... | 2 30 | ... | 7·06 |
| 3 0 | ... | 6·814 | ... | 6 15 | ... | 8·08 |

The disagreement is conspicuous, but the explanation offered by Dr. Scheiner is scarcely satisfactory. He would ascribe the constancy in the value of $b$, found by Dr. Charlier, to the fact that in his experiments there is always a large absolute value of the time coefficient. It will, however, be observed that the ratio between Dr. Charlier's extreme exposures is not greatly different from that which obtains in Dr. Scheiner's experiments.

If it be admitted that the product of intensity by the time is *not* a constant quantity, it becomes a matter of great practical importance to determine what is gained on a photographic plate by prolonged exposure. This question forms the real investigation of Dr. Scheiner's two papers, and though some of his results may be questioned, yet the general issue is so grave and disquieting that it may not be utterly ignored. Passing over the details of his method of examination, and the precautions taken to ensure accurate results, for which the reputation of the Potsdam Observatory is a sufficient guarantee, Dr. Scheiner presents the following table, in which is exhibited the faintest magnitude which, under certain varied circumstances, can be detected on a photographic plate:—

| Time of exposure. m. s. | | Faintest Magnitude. Plate I. | | Plate II. | | Plate III. | | Plate IV. |
|---|---|---|---|---|---|---|---|---|
| 0 24 | ... | 9·0 | ... | 6·4 | ... | 7·7 | ... | 8·2 |
| 1 0 | ... | 9·4 | ... | 7·25 | ... | 8·3 | ... | 8·75 |
| 2 30 | ... | 9·9 | ... | 7·7 | ... | 8·55 | ... | 9·3 |
| 6 15 | ... | 10·6 | ... | 8·45 | ... | 9·3 | ... | 9·65 |
| 15 38 | ... | — | ... | 8·85 | ... | 9·7 | ... | — |

It will be noticed that, while each successive exposure is 2·5 that of the preceding, the corresponding gain in light is considerably less than one magnitude. From each of the four plates the gain is as follows:—

| | | | Gain in mag. |
|---|---|---|---|
| Plate | I. | ... | 0·53 |
| ,, | II. | ... | 0·61 |
| ,, | III. | ... | 0·50 |
| ,, | IV. | ... | 0.48 |

The mean is 0·53—that is to say, instead of one magnitude being gained by continued exposure through each successive interval, the actual gain is only half a magnitude. The exception that might be taken to these experiments is, that the detection of the feeblest stars on a plate is a matter of doubt and great practical difficulty. Dr. Scheiner has, however, availed himself of a second test by counting the stars on a plate after various exposures. With this view two plates were taken of the region round $\epsilon$ Orionis, one with an exposure of one hour, the other with eight hours' exposure. Therefore, if 2·5 times the exposure produced stars a magnitude fainter, there ought to be a gain of more than two magnitudes on the second plate, and it may be assumed that the number of stars impressed would follow the known law. On the one-hour plate were found 1,174 stars, on the eight-hour 5,689.

There ought to have been on the long-exposed plate over 10,000 stars, so that roughly speaking only one-half of the stars given by the law were photographed. Further, Argelander has catalogued within this area 125 stars, and therefore it might have been anticipated, from the law of increase, that some 10,000 stars would have been visible, on the one-hour plate.

This margin is too great to be readily explained away. Of course, there is the same difficulty in perceiving the minute dots that represent the faintest stars as in the former case, and further, it is possible that the law of average increase of the number of stars did not hold in this particular part of the sky. It is not to be expected that a law which applies with more or less accuracy, *on the average*, to the whole of the sky, is necessarily fulfilled on any small portion, such as the ten-thousandth part. If the stars are not in the heavens, they cannot be photographed. Evidently, it would be unlikely that on every thousandth part of *that* plate would be found the thousandth part of the total number of stars impressed.

But allowing for errors of exaggeration and observation, the result is very interesting, and not a little alarming, as implying that photography is not so powerful an engine as was at first anticipated, and that, to accomplish the full hope of all that was expected of it, longer exposure and consequently a greater expenditure of time will be needed. Dr. Scheiner gives a little table, which shows that if a star of the 9·5 mag. be registered in twenty-four seconds, then in 190 minutes a star of the 16·5 mag. will be photographed, supposing a whole magnitude to be gained by successively multiplying the exposure by 2·5. But if the gain be only 0·5 in this interval, then the faintest star impressed will be only 13·0 mag., even after this long exposure, If 0·6 of a mag. be the rate of increase, then the 13·6 mag. will be seen; if 0·7, then 14·4 mag. The truth will probably be found near this latter limit.—*Nature.*

## HELIOCHROMY.

BY DR. ED. LIESEGANG.

The sceptical belief in the solution of the problem of heliochromy seems to increase more and more. Niepce, Becquerel, Poitevin, and others were unable to satisfactorily fix their heliochromes. Veress has also failed so far, although his experiments in that direction have not yet ceased. Lippmann succeeded in fixing the results obtained by inferential colours completely, as the plates were sensitive for the different light waves. It is questionable whether this method has any advantage over chromocollotypy.

Dr. R. Kopp, in Münster (canton Luzern, Switzerland), believes that he has succeeded in uniting the advantages of the chemical and physical methods by a new process, which he has been three years in perfecting. He claims to have succeeded in impressing all colours on a single film, with short exposure and permanency of the product. The following extracts are from his direct communication in relation to enclosed samples:—

1. All the colours and colour shades, including white and black, are reproduced by true heliochromic principles, therefore are the result of direct photography.

2. The time of exposure, in contrast to previous experiments, is greatly lessened, and varies with direct sunlight from thirty to fifty seconds; in diffused light the time is naturally lengthened.

3. The fixing is successful, but in a long exposure to direct sunlight the image suffers somewhat.

The absolutely perfect fixation in my process is unquestionable, and it will not be long before I send you a specimen which will withstand the brightest sunlight.

Dr. Liesegang states that the four specimens sent by M. Kopp were copies of transparencies and glass pictures on paper. Red, violet, yellow, and green were well represented. The experimenter adds: "You must not say that the reds or blues here and there are not good. This is not my fault, as you well know. It is exceedingly difficult to obtain colours equal to spectrum colours in copying glass paintings, paper pictures, or stained glass, as they are not pure, but mixed colours, which will not reproduce as they appear to the eye, but as they really are optically."

It is always requisite that the ground should be a pure white. Becquerel obtained a pure white in his heliochromes on silver plates. According to the theory of Niepce, this must result when the argentic salt is formed of chlorides which whiten under the flame. Later he obtained the same result by coating the image with chloride of lead. Lacan mentions a "dazzling white" in his heliochromes. Poitevin makes no mention of white in his paper proofs. Simpson's were unsatisfactory. In Veress's samples the ground was yellow-brown. This atavism in Kopp's process is nevertheless significant.

Concerning the time of exposure, M. Kopp continues: "The time of exposure, as before noted, is a very short one. During July, on a clear, hot day, I copied a picture in twenty seconds in the direct noonday sun; the whites were complete in ten seconds. I further believe that I shall be able to increase the sensibility of the emulsion so as to be able to produce pictures in the camera with a relatively short exposure. The weather was unsuitable for camera experiments; yet I obtained results, thanks to the extreme sensibility, which remove all doubt as to a successful result in the near future. I have obtained the greens and yellows of the meadows and trees entirely true to nature. I resolved not to send out any proof of camera work until I have arrived at a certain degree of perfection, else I should have included a specimen."

We will but remark that Niepce obtained views in the camera in fifteen to thirty seconds. Saint-Florent got the same results on paper in fifteen to sixty seconds. Veress claims one and a-half hours for a contact print.

M. Kopp continues: "That the fixing of the enclosed prints is permanent may be judged from the fact that they have been handled and exposed to all sorts of light. It requires a strong light and long action to destroy the prints."

For the present we cannot agree as to the permanency, as in one sample, half of which was exposed to the sun, the white ground soon changed to violet. The other colours, green and yellow, remained unchanged. M. Kopp promises in the near future to send a proof which will stand the requisite test. The production of the pictures, which differs materially from any former process, M. Kopp does not wish to publish at present. As the experiments continue, complete permanency will, without doubt, soon be achieved.—*Photo. Archiv.*

Photographic Club.—Subject for October 21st, "The Theory of Development"; 28th, smoking concert and exhibition of members' pictures.

## Notes.

The Editor begs to thank the numerous friends who have sent him their valuable contributions to the forthcoming Year-Book of Photography for 1892. He also takes this opportunity of acknowledging many kind promises to send. As the matter in hand is now being made up into pages, he will be still farther obliged if those who have promised contributions will send them in quickly. In asking this favour, he is mindful that last year some of the articles arrived too late for insertion, and others had to be printed in such haste that there was no time to submit proofs to authors.

We reproduce this week a picture to which brief reference was made in our last issue. It appeared originally in a French paper, and is said to have been taken immediately after the suicide of General Boulanger. The picture is, we think, open to some doubt. In the first place, the small crowd which quickly assembled directly the report of the pistol was heard would hardly stand aside while the camera was adjusted. Their attention would naturally be concentrated upon the body of the unfortunate man before them, and they would be busied in raising him up and ascertaining whether life was extinct. In the second place, it would be an extremely easy thing, after the body had been removed, to place a living man in the position which it had occupied. The want of likeness of the living man to the dead one need present no difficulty if the face were hidden, as in the picture under discussion.

A new and charming method of book illustration is indicated and demonstrated in an article which appears in the October number of the *Bulletin du Photo Club de Paris.* The pictures are collotypes of small dimensions; but, instead of being printed on special paper separate from the text, they are interspersed with the letterpress, giving the pages a very attractive effect. In this case the collotype printer has done his work first, leaving to the ordinary compositor the task of filling up the blank spaces left. The little pictures are, in this case, very pretty in themselves. They are photographs from life, and represent a small child dragging about, playing with, and otherwise maltreating a couple of St. Bernard pups. This, of course, cannot be a very cheap method of book illustration; but, for certain purposes, when expense need not be considered, it is, perhaps, the best that could be devised.

Has the Zoological Society a photographic establishment in the Regent's Park Gardens? We are afraid not, but that it has to depend upon outside efforts for its photographs. Many fine collections are extant, notably those of Mr. Frank Haes, Mr. Dixon, and Major Nott; but it is evident that the work of these gentlemen can only be done at intervals. A photographic staff attached to the Gardens would have constant opportunities of studying the animals, and of recording peculiarities, and would thus render a great service to zoology. As a commercial speculation, a photographic establishment should pay; hosts of visitors would be glad to preserve mementoes of the animals if the prices were moderate.

Photographers troubled with customers who are not very ready in paying their bills might take a hint from Russia. According to a society journal, Russian photographers, when they can't get a settlement from their sitters, hang the portraits of the latter upside down. It is to be presumed that the significance of this is understood by the public, or it would have no effect. An Odessa paper has entered a protest against the practice so far as children are concerned; it does not think that the sins of the fathers should be visited upon their offspring.

The pastel portrait trick, which was some time ago exposed in these columns, is still flourishing. Apparently, dupes are plentiful. The swindle has, it seems, a Yankee origin, and the nuisance is carried on to such an extent in America that the Government has undertaken the task of stamping it out, the Public Prosecutor proceeding against the managers, and the post office refusing to cash their money orders. It is to be regretted that newspapers over here insert the advertisements of the gang.

Although photographic fashion plates have not succeeded, foreign *modistes* make use of the photographs of their customers. The death of the Grand Duchess Alexandra of Russia, for whom three months' mourning has been ordered, has suddenly made the Paris dressmakers exceptionally busy, one firm in the Rue de Rivoli receiving an order for 214 dresses for the Imperial family. We are not told how the dressmakers get over the difficulty of fitting without seeing the wearers, but it is interesting to know that photography renders some assistance in giving views of the personages who were to be dressed.

A newspaper paragraph describing the presentation of a portrait of the late Mr. Bradlaugh painted by Mr. Walter Sickert for the hall of the Manchester Secular Society is rather puzzling. We are told that Mr. Sickert painted the head from a photograph by Mr. Vanderweyde, but the clothes are those which Mr. Bradlaugh actually wore. Are we to infer from this that when Mr. Vanderweyde photographed Mr. Bradlaugh the latter did not wear the clothes which he actually wore?

The photographic profession will be much exercised in its mind if the rumour be true that the Queen now refuses altogether to be photographed. The story is that Her Majesty was completely satisfied with the portraits taken of her in the jubilee year, and that she thinks these cannot be improved. The Queen and the Royal family have been such good friends to photography and photographers that we doubt the truth of all this. At the same time, it is quite likely she may object to be the subject of a snap-shot. It seems that one of the gentlemen in waiting had the presumption to present his camera as she was passing, and, though Her Majesty afterwards asked for a proof and laughed at the caricature, it was understood that the act must not be repeated. Probably this is the foundation for the rumour referred to.

Mr. Garrett P. Serviss, in an article in the *New York Popular Science Monthly*, deals with the probable longevity of the sun, observing that the question whether it is still approaching the climax of its radiations or has passed that point and is descending the scale, depends, so far as our knowledge concerns, upon the revelations of the spectroscope assisted by photography. The conclusion Mr. Serviss comes to is, that there is every reason to believe the sun will long continue in its present condition, and that astronomers a million years hence may still be found studying the sun, though it would not be safe to assume that any astronomers will be left upon the earth five million years hence.

## ARCTIC PHOTOGRAPHS.

BY JAMES MEW.

WHEN John Davis, of Sandridge, some three centuries ago, spoke of Greenland as a "Land very high and full of mightie mountaines, all covered with snowe, and no viewe of wood, grasse, or earth to be scene, with a lothsome shore running a league into the sea, and beset with ice, of which the irksome noyse was such that it bred strange conceites among us," he gave a fairly vivid representation of one of those scenes of awful solitude in a region which the photographs taken during the Arctic Expedition in 1878, and presented to the British and Kensington Museums, and three hundred views made by Sergeant Rice in 1881-4, under the command of Lieutenant Greely in his "attainment of the farthest north," have rendered generally familiar to the photographic world. But the language of John Davis, mariner, though graphic and full of energy, cannot compete with the system promoted or called into being by Daguerre, in presenting an exact conception of those long miles of palœocrystic ice-floes which have taken years upon years for their formation; of those uneven, irregular hummocks, rising like hills above their frozen plains; of the rubble or loose detritus which abounds on the Arctic highway; and of the glittering bergs of all conceivable varieties of form, cubical, with regular lines of cleavage, and apparent stratified structure, conical, pyramidal, amorphous, of which photography has furnished so many illustrations. The "Musitians" carried by the *Sunshine*, the good ship of John Davis, were but a bad substitute for a photographic kit, and the "white bears of monstrous bigness supposed to be goats or wolves" at Totnes rode under Mount Raleigh, are not so clearly presented to us as the animal "photographed by Sergeant Rice," as Mr. Greely puts it in somewhat strange connection, and "skinned by the Eskimo."

In the handbill attached to the display of a popular exhibition in London, we are told that the North West Passage "bristles with numerous points of interest." The phrase is happily chosen with regard to the jagged points of ice which surround on every side the explorer of the Arctic seas, but interest—that is to say, sustained human interest—is so notoriously absent from these monotonous realms that the great difficulty in every successive exploration has been to amuse the crew, and to hinder them from failing sick and dead of sheer listlessness and *ennui*. Had the sailors who accompanied Sir Hugh Willoughby or Martin Frobisher in the middle of the sixteenth century, or those who sailed with Hudson or with Baffin in the beginning of the seventeenth, been acquainted with the resources of what is commonly called at sea the "cambra," some pleasurable excitement would surely have been produced; but even then the "points," except in the sense above-mentioned, "of interest" would have been very far from numerous.

The nearest acquaintance of most of us with the polar seas consists in a visit paid to the Bear of the Sea, the so-called polar bear of the "Zoo." This miserable beast, a prisoner for life, condemned to dwell, for the gratification of idle curiosity, in an iron-barred cell, some few feet square, with a little dirty, luke-warm water in its midst, can now at best but dream—if white bears dream—of those unfathomable seas and icy halls of cold sublimity in which he was once wont to wander free under the stars of the Frigid Zone. With a fine spirit of satire, worthy of Gibbon or Voltaire, the author of "The Guide Book to the Gardens" speaks of his narrow prison as "admirably adapted for the exhibition and comfort of the animal"; while it explains the weary and ceaseless wandering to and fro of the wretched captive, which must surely touch some sense of pity in the most senseless spectator, as the "constant motion which he invariably keeps up, indicating the restlessness and energy of his character." But habit, it is said, is a second nature, and *Ursus Maritimus*, Linn. Hab. Polar Regions, has, it may be hoped, become accustomed to his cramped position, though the "energy of his character" seems yet unaltered; as he may also have become used to the Bank Holiday crowds, which have succeeded for him the majestic and everlasting solitude of his original home.

It is this solitude, this absence of life, which gives the greatest interest to the pictures of the Pole. Seldom, indeed, can any human influence disturb the lonely grandeur of nature under the Arctic skies. Days of months succeed nights of months, where man is not. Man's dominion, says Byron, is limited by the sea, but the ocean has now become the world's high road. It is rather the sea of ice which forbids his further progress, the frozen ocean which makes the regions of the north as silent and as solitary as our own earth once was in that far-back glacial period when man's existence was unknown. It is the solitude, the absence of life, which gives the greatest interest to Polar pictures; but it is also the cause of their paucity. It is also the cause of many portraits of harpoon-guns and picks, ladders and anchors, ice-saws and snow-shoes, tents and bedding, sledges and cooking utensils, duffel-bags and bears, lummes and eiderducks, Eskimos in or out of kayaks, and seals.

Pictorial records of the Arctic regions have been produced by the camera with far greater exactitude—which goes, as the French say, without saying—than the pencil could have drawn them on canvas. The scenery of places within 400 miles of the Pole, a situation defended by ice which cannot, apparently, be passed by man; ice of every shape and form, mountains of ice girt with storm clouds, huge icebergs with fantastic arches fashioned in some idle freak by the fingers of frost, towering glaciers—all these, the scenery of a land of silence and desolation, may now be studied at will in the summer sunshine, or in some cosy corner in the blaze of our winter fire; and we may appreciate them more, if we do not more enjoy them, by a recollection of the hardships and perils attendant upon their execution.

Of the many difficulties with which photography has had to contend in the Polar regions, most pathetic accounts have been given by patient and persevering artists; and without these two qualities, without perseverance and patience in a full and heaped-up measure, it is indeed idle to think of taking pictures in the Arctic seas. There is, in the very head and front of photographic offences, the stumbling block of interrupted repose. This rest, so essential to the securing of a good picture, it is almost equally arduous to find on land or sea. The vessel is rarely still, even when the air is calm, but in that condition of the weather known to mariners as "dirty," or when the good ship is literally ploughing its path through huge floes which inflict shocks upon it from every side, even the preliminary arrangement of the fragile stock-in-trade of the photographer is by no means easy. On land—or rather on the masses of ice which pass for *terra firma* at the Pole—there is commonly some degree of agitation, and, even were this not the case, the super-incumbent snow is all too apt to make the station of the artist insecure. Then, again, the field exposed to the lens is unstable as water, and the pictures, from these double difficulties, have as little chance as Reuben of ultimate excellence. What has been said about the conditions of place may also be affirmed of those of time. Neither are satisfactory. In the matter of duration of exposure there arises the following dilemma. If it is short —and ice and snow reflect so much light that two seconds suffice for them—dark objects, such as the picturesque patches of grey slate or quartzite peeping through the white shrouds of the mountains in the background, have no time to put in their appearance. If, on the other hand, it is long—and at least thirty seconds are found necessary for these distant hills—then the ice appears absolutely without detail, and the negative is wholly useless. The season, too, of taking photographs in the north is often weird, uncanny, and uncongenial. Some of the best pictures have been taken at midnight. Of such pictures is the representation of an immense glacier, like a frozen river winding down ravine and gully, and bathed in the shine of an Arctic summer's nocturnal sun. Often, too, at mid-noon, the photographer is obliged to be idle, owing to the absence of the greater light which rules the day in the firmament of the heaven. Now a picture is spoilt by fog, an atmospheric condition which seems to be, from all accounts, as frequent in the North Pole as in our own favoured country, *le pays*, as the Frenchman calls it, *des brouillards*—the land of mists; and now by impurities of water, which, in the majority of cases, can only be procured from melted snow. Developments are commonly effected during the short summer, when Pindar's best of liquids is other than thawed ice, and not too salt to satisfy the photographic equation. A photograph taken at 96° below freezing by the albumen beer process is a curiosity indeed. Dust, we are told, is a cause of annoyance, but this is a common curse, though, if any escape from it were possible, it would be, one would suppose, in those unpopulous regions of which this article treats. Dust, like the poor, we have always with us, but who *a priori* would have suspected its presence in the desolate fiords and headlands of Spitzbergen, or on the bleak, rugged coasts of Nova Zembla? On lonely Mount Misery in Bear Island, in Baffin's Bay, in the Greenland seas, the everlasting duster of the well-girt housewife might well have been thought alike unnecessary and unknown. In addition to all these ills and obstacles in the path of success must be mentioned the unusual effect of the northern light, temperature, and air on the ordinary processes of photography, of which, in no few cases, a want of density, and dark, mottled stains are the disagreeable result. Even in the narrow apartment of confined space which constitutes the sacred chamber of the photographic mysteries—a chamber for which, on board ship, very little room is allotted and allowed—streaks of an unsightly appearance are produced by the condensation of moisture, if the words of an experienced photographer, which there is no reason to doubt, may be relied on.

Appalled by all these adverse circumstances, it has occurred to the ingenious artist to pluck the rose without the thorn, or to present pictures of ice and snow and other varieties of Arctic photography without a journey to the Arctic Pole. But the simulation of these in the studio is also not without its many difficulties. The inventive genius of man has, however, discovered that rough green glass is a very fair substitute, so far as appearance is concerned, for ice, while snow may be supplied by sundry devices, among which salt, or fine, feathery white down, which gives a yet lighter and softer image, are not the least ingenious or satisfactory.

## PHOTOGRAPHY ON A BLACK GROUND.

It is now very long ago that our readers, says *La Nature*, learned to know, through the qualified pen of Mr. A. Londe, always on the alert for photographic novelties, the varied effects that may be obtained, either from an artistic or a simply amusing point of view, by the use of what is called the Russian background. But more than one amateur assuredly will have met with the difficulty of obtaining (aside from a special installation) the necessary perfections in backgrounds or screens, especially since the fashion has turned to the bust portrait degraded upon black. So our readers will doubtless thank him who, in these very pages, was one of the first to recommend the magnesium flash-light, for pointing out a process within the reach of everyone for executing the most extraordinary combinations that the imagination could suggest, without complicated accessories, and by a simple, judicious use of artificial light.

In the first place, what is blacker than a window open at night on the darkness? The flash-light permits of making any exposure whatever in front of it, and the black of the background will certainly rival that of the first studios of the the Boulevard.

It will be said that this is not a very practical method in cold-in-the-head weather. Let us close the window, then, without insisting, and let us open the door. One has always, even in the winter of 1891, a door for opening in his house. A little back of the embrasure let us place the model face to the apparatus, and then let us flash the light at the side, as he sits for the artistic effect. A deep shadow projecting itself behind the sitter will furnish us with the desired black ground. Black, I say, whatever be the real colour of the said ground, and whatever be the lights burning in one or the other room; black, that is to say, inactinic for gelatino-bromide, although visible to our eyes. For there is a prejudice against which I cannot too much protest; it is useless, even in order to operate *upon* black, to condemn one's self to operate *in* black. The magnesium light alone counts from an actinic standpoint; and all the light furnished by the candles, kerosene lamps, gas, or even incandescent lamps that may exist in a room, would require, in order to give however slight an impression of the surrounding objects upon a photographic plate, so long an exposure, so great a fraction of an hour, that it may be absolutely disregarded. The full aperture of the lens must be used in the operation which we are considering. Even when there are directly in the field one or more of those sources of light with which we are content for domestic purposes, but which, as white as they appear to us, are nevertheless really yellow or red, and contain few violet rays, what will happen? They will pose simply with their surrounding, the image of which is so slightly veiled, even for the nearest objects, that it is a chance if we find a trace of it where these objects, through some polished surface, have performed the function of reflectors and not of simple diffusers. As for the image of the flame, that will be perfectly defined, with all of its details. At the worst, if the exposure has been of an exaggerated length, it will be found surrounded on the negative with an aureola, or halo, due solely to the reflecting action of the glass employed as a support, and which has nothing in common with what is called the veil, any more than it has with another accident that occurs with a still further prolonged exposure, and which consists in the reversal of the image, positive objects appearing upon the negative.

It is, therefore, useless (and I repeat it earnestly, on account of the contrary belief of so many professionals) to make night in order to photograph night, and to believe that one is obliged, for example, to represent a drawing-room without chandelier and a dinner without candles. To return to what occupies us, leaving all undisturbedly lighted, let us be anxious only lest our background shall receive at second hand too great a number of magnesium rays diffused through the part of the room where we cannot entirely prevent the reflection of the flash from penetrating. For that, the utilisation of the leaf of the door, open on the side of the sitter opposite the flash, will have the double advantage of arresting, on the passage, the greater portion of the rays that tend to enter the dark room, and of sending them back to the side of the sitter, who, without that, would run the risk of being too deeply shaded. It is possible, even, by placing the sitter and light geometrically in a right line with the edges of the jamb and the open leaf, to prevent any direct ray from entering the room. After this the darkness of it will be certainly comparable to that employed by Mr. Marey for his remarkable photo-chronographic studies on locomotion, that is to say, the most perfect that has been realised up to the present.

Since now, without trouble and expense, we are here possessors of an ideal background, nothing remains but to utilise it in order to derive from it all that it is capable of giving us. To commence, would you like to try one of those simple, degraded blacks which so well bring out light clothing? It will suffice, after making the exposure as indicated above, to operate according to the classic method by putting into the camera a shutter containing an aperture which allows of the passage of only that part of the image that it is desired shall reach the plate.

Does the operation seem to be somewhat delicate, and does the regulation seem tedious by the light of the candles? Or does the apparatus refuse to allow of the introduction of the shutter? This is how it always will be possible and easy to operate. Take some sort of a dark fabric, and, throwing it over the back of two chairs a slight distance apart in front of the sitter, regulate the curvature of the falling fold in such a way as to conceal the sitter up to the shoulders from your eye, placed against the objective. Then flash the light in front of this screen in such a way that the face seen from the apparatus, receiving no direct ray, shall remain black for the objective. There will be thus obtained upon the plate a bust entirely detached from a dark ground and degraded toward the bottom, where the edge of the veil will have become so much the lighter and softer in proportion, as it will have been less perfectly in focus, that is to say, nearer the apparatus.

There is no need of adding that, on reversing the process —that is to say, on substituting white for black, light for shadow, and a sheet (or better, on account of the folds, indented cardboard) for the drapery—it is possible to obtain directly upon the negative the ordinary degraded white that it takes so much trouble to obtain in printing photograph by photograph. So it is to be wagered that, having got a liking for it through an easy success, you would not wish to stop there, but would feel inclined to apply the method to the realisation of some of those tempting trifles to which attention has so many times been called in this journal.

Who has not, after making a negative, been confronted by the too sensible difference between the blacks of the profiling and the accessory draperies? Now, by the use of our background, the risk would be much lessened; but to succeed almost to a certainty one has only to proceed as follows. A first exposure on a shadow ground is made with the pedestal, the position of which must be accurately marked on the ground glass. Then a second exposure of the model in half-length degraded upon black, so regulated that the soft lights of the bust on the ground glass are lost over the pedestal—an operation that is reduced to a simple control if advantage is taken of the fact that, this time, there is nothing to prevent the pedestal from being left in place in front of the model, since it must, in definitive, be hidden by the veil.

Upon the negative we will find the image of the pedestal separated from the bust by a degraded zone, a few lines of which, through a broad after-touch, it will suffice to arrest and make more marked, in order to obtain a result which will not only have suppressed the faults of the profile, but also and especially its stiffness, &c., in the cut-out parts of the living bust.

Remark that it would have been perfectly allowable for us at the first exposure (that of the pedestal) to take at the same time, around the pedestal, any group whatever of persons or objects filling all the parts of the black field that it was not necessary to reserve for the bust itself. And then, instead of the effect of a solitary and somewhat conventional bust, the trick of which is easily defined, we obtain family pictures which are very puzzling through the presence, in a second edition, of the person all entire from head to foot, a part of whose form attracts in the first place one's whole attention.

The system of double exposures thus understood, may, moreover, with a little additional complication, lead us to applications in other ways, original without being much more difficult, by combining changes of distance of the apparatus between each of the operations.—*Eng. Mechanic.*

---

Positive Prints on Paper.— Dissolve in water 1,000 grammes, peroxalate of iron and ammonia 300 grammes. This solution being prepared, keep it in obscurity, as it is rapidly decomposed by light. Choose a paper sized with gelatine, use the smoothest side, and make a mark on the back with a pencil. Pour the above solution into a porcelain dish, float your paper on the solution for four minutes, and hang up to dry in obscurity. The solution may be used until exhausted, and the paper coated with this salt kept indefinitely, provided they are both kept away from the light. The exposure in the positive frame is made according to the intensity of the light or of the print; if on coming from the frame the print appears a little weak, or in the condition of a negative, care must be taken to have at once recourse to the following operation:— The print is floated on a five per cent. bath of nitrate of silver. For the sake of economy, the print may also be placed on bibulous paper, and the surface rapidly passed over with a cotton brush (a wad of cotton in a tube). The image immediately appears of a purplish-brown colour if the exposure has been good. If the paper is sized with starch or arrowroot the tone of the image will be blacker. The print may be toned with chloride of gold. It is fixed either with hyposulphite of soda, or in the following bath:— Sulphocyanide of potassium, 100 grammes; water, 1,000 grammes. Wash in several waters. —Chas. Gravier in *L'Amateur Photographe.*

## FERROTYPE DRY PLATES.

There will always be a need for itinerant photographers, and although some persons were sanguine enough to believe that automatic machine-made pictures would drive them out of the field, they still exist, and do a more or less successful trade at most places of holiday resort. It is an essential feature of this kind of photography that the pictures should be produced with speed. There must be no waiting for negatives to dry, or for prints to be made from them. The surface impressed by light must itself form the picture which is handed to the customer, who will probably go off without it unless it is forthcoming in a very few minutes after the exposure has been made.

The wet proces has, for many reasons, been the method adopted by the itinerant professor of photography, in the old days in the form of a positive on glass, and more recently it has taken the shape of a positive on metal, the trade name for which is "ferrotype." But, like his superiors, the "tintype" man has wished that the dirty silver bath could be dispensed with, and that his plates could be supplied to him in a dry condition. The demand was speedily met by a supply of ferrotype dry plates, but they possessed so many disadvantages that they did not come up to the requirements of the busy worker. Now, however, a new ferrotype dry-plate process has been worked out by Mr. L. Nievsky, and plates prepared by his formula are placed on the market by Mr. Fallowfield. We have recently had an opportunity of seeing what these plates will do, and we believe that they will have a wide future before them.

While not so quick as gelatine plates, they are certainly quick for collodion, while the speed at which they are developed, fixed, and finished is astonishing. In our presence a portrait was taken with three seconds' exposure, development of it was completed in twenty seconds, and in one minute more the plate had been fixed, washed, and dried. The surface required no varnishing or any after-treatment, the film being almost as hard as the metal upon which it rested.

But the new ferrotype process is by no means intended for the exclusive use of the professional photographer. It is believed that many amateurs will avail themselves of it; not, of course, as a substitute for gelatine, but as a means of enabling them, by way of amusement, to take photographs and show the results obtained within a couple of minutes of capping the lens. Thus, at a garden party, or similar gathering, the amateur "tintype" man with these new plates would be able, within half-an-hour, to show quite a gallery of portraits of the people who happened to be on the ground, and who would gladly consent to sit to the artist, and Mr. Nievsky has designed a compact little developing box, which can be used in the open air for this kind of work.

But there is another way in which these plates will appeal to the amateur worker. By shutting up a plate in a printing frame behind a transparent positive—say a lantern slide—and giving a momentary exposure to daylight, or about six seconds to lamplight, a positive copy can be obtained, which can be developed, fixed, and dried in something less than two minutes. We can imagine many an instance in which this wonderfully quick copying might be of value, and at a pinch a new negative might be made from such a picture, if the original one happened to get broken. This new process has much to recommend it, and those who are interested in photographic novelties should give it a trial.

## THE PANORAMIC PHOTOGRAPH.

For a long time the reproduction of panoramic views has put to the test the ingenuity of the inventors, for, besides the artistic interest which the photograph can excite, the extent of view involves certain difficult operations of levelling and of topography. The first apparatus constructed of this kind, says *La Nature*, appears to have been presented to the Academy of Sciences in 1815. Since, numerous instruments have been invented, but none of any practicability within the last few years. The problem was very complex, but from the first inventors have indicated perfectly the theoretical solution. They have, however, encountered in their search very serious difficulties, which have not been overcome until very recently. They have from the commencement combined the objectives embracing a very considerable angle; but in these objectives, as elsewhere in all the photographer's objectives, they know that the light rapidly diminishes from the centre to the edges. The angle obtained does not exceed 125 degrees. This result is certainly very appreciable, but they were far from the panoramic view which should embrace the entire horizon, that is to say, 360°.

The first really practical apparatus was invented in 1889 by M. le Commandant Moessard, where the image is obtained upon a film of the cylindrical form. This result is attained by pivoting the objective upon the nodal point of emergence. This solution, very fine of the problem theoretical, is realised by an instrument of which the details have been studied with great talent. Another inventor, M. J. Damoizeau, proposes another solution, offering in practice many very substantial advantages. The apparatus of M. Moessard can give but one-half of the horizon; for the complete panorama it is necessary to have two operations. The apparatus of M. Damoizeau permits the panorama to be taken in one operation, and allows the employment of objectives of different foci. In this quality it differs essentially from apparati that have preceded it. It is this that constitutes its originality and novelty. The apparatus is composed of a dark chamber pivoting upon a circular plate carried by a photographic tripod. The frame before the door of the objective can place itself vertically; the back frame is constructed of a roller frame of particular form; these two parts are united by a bellows chamber. To this point there is nothing new. We have a photographic chamber furnished with a roller frame, but where the difference is, it is in the mode of making. In the ordinary chamber it is necessary to be immovable; here it is not at all necessary. The chamber pivots upon the central axis, so that the objective runs over the entire horizon; but at the same time the sensitive preparation advances with a regular movement, so as to present always to the action of the light a virgin part of the surface. Notwithstanding the displacement of all the parts of the apparatus, the image is absolutely clear.

This double movement of the chamber and the progression of the film is obtained by a clockwork mechanism placed under the roller frame. The good working of the instrument which corresponds to the perfect clearness, results from the synchronism which exists between the rotation of the apparatus and the unrolling of the film. The clock movement is upon the circular plate, where it progresses by adherence, and the other it commands by the means of wheelwork calculated *ad hoc* the movement of a cylinder conductor, which gives to the film the rapidity of unrolling desired.

## ALUMINIUM AS A SUBSTITUTE FOR MAGNESIUM.

It has been claimed by scientists for some time past that aluminium in minute particles burns in the air, and generates an intense light equal to magnesium. At a late meeting of the Photographic Society of Vienna, Herr Patz presented a number of experiments showing that magnesium may be replaced for photographic purposes by the far less costly aluminium. His results were as follows:—

Aluminium leaf ignites readily, is not dangerous, and burns with jets of sparks (scintillation).

Coarse aluminium powder failed to give satisfactory results.

Fine aluminium powder mixed with chlorate of potash and sulphide of antimony gives good results, but generates smoke equal to the magnesium compounds. However, if the sulphide of antimony is dispensed with, this objectionable feature is overcome [?—Ed. *Wochenblatt*].

Powdered aluminium blown or thrown through a flame will not ignite.

These general results obtained were similar to those arrived at in a course of experiments undertaken several months previous in Berlin by the staff of the *Photographisches Wochenblatt*—presumably by Dr. Miethe in person. For this purpose fine aluminium filings and aluminium bronze powder was used, the latter such as is sold on the market as a substitute for silver bronze.

Aluminium filings, on being forced through a Bunsen flame, failed to ignite; but, combined with some of the various substances containing oxygen (chlorate of potassium, nitrate of potassium, manganate of potassium), ignited in the usual manner, but the whole mass failed to consume entirely.

If anhydrous glycerine is dropped upon a mixture of manganate of potassium and aluminium powder, the compound frequently ignites and burns with a not very strong light, while a magnesium compound under similar conditions would explode with an intense light action.

Aluminium bronze powder—which, by the way, is considerably dearer than magnesium—may be blown through a Bunsen flame, and the combustion will be almost complete, provided the flame is sufficiently large, and the propelling air properly separates the particles. The chemical action of the light was active, and the resulting smoke hardly noticeable. The same powder mixed with finely-ground chlorate of potassium, with or without sulphide of antimony, burned a little slow, and without giving forth any strong light. On the contrary, if combined with manganate of potassium, the mixture burned quickly and gave a bright illumination. But even the latter mixture does not always ignite with absolute certainty when treated with a drop of anhydrous glycerine, and, in case, even in small quantities, an ignition does take place, it is invariably accompanied by a loud detonation.—*Amer. Jour. of Photo.*

---

The *Scientific American* points out that, by heating resin with sulphur to about 250° C., a reaction takes place, attended by the evolution of sulphuretted hydrogen, and leading to the formation of an almost black, pitchy substance containing sulphur, and resembling Syrian asphalt in many of its properties. Thus, it is insoluble in alcohol, but dissolves readily in chloroform and benzene, and is sensitive to light in the same way as Syrian asphalt, for which it can be substituted for photographic purposes.

# Patent Intelligence.

### Applications for Letters Patent.

16,936. Thomas Ernest Smith, Sandringham House, Osborne Road, Southsea, "A Double Action Instantaneous Shutter for Detective Hand-Camera."—*October 5th.*

17,143. Arthur Brin, 53, Chancery Lane, London, "Improvements in Photography and in Photographic Apparatus."—*October 8th.*

### Specifications Published.

6,825. *May 3rd*, 1890.—"Indicator." J. Parkinson, South Regent Street; S. Fawcett, Elm House, Meeting House Lane; and C. F. Parkinson, South Regent Street, all in Lancaster.

In roller slides the measuring roller is provided with a pinion which actuates directly, or through a train of wheels, a numbered registering wheel. The pinion may have only a single tooth, or it may have several teeth, the number of which is not exactly divisible into that of the wheel, in which case the indicator is suitably graduated. (Patent opposed. Case not yet decided.)

7,010. *May 6th*, 1890.—"Instantaneous Cameras, &c." B. J. B. Mills, 23, Southampton Buildings, Middlesex. (L. Lumière, 21, Rue Saint Victor, Lyon-Montplaiser, France.)

The camera is provided with an opening at the back for the insertion of the plates. These are enclosed in sheaths, which consist of metal plates with turned-in flanges on three sides, and with trunnions. The trunnions are placed in guides. When all the plates are inserted in the camera, the back, which is provided with a spring to push the plates forward, is closed and secured. The trunnions of the front sheath engage in notches in discs mounted on a spindle, which is worked by a thumb-wheel on the outside, and other trunnions abut against prolongations from vertical guides. The front plate, when in this position, is exposed, and to prevent accidental exposure the shutter may be so connected with the disc that it will be fastened until the trunnions enter the notches on the disc.

To change the plates, the disc is further rotated, thus permitting the plate to slide down the guide and allowing the next to come into position for exposure. The next, on being released, causes the first to swing and fall flat on the bottom of the camera. The fall is broken by springs at the sides, which springs also serve to retain the plates to the bottom.

---

Received.—From Mr. E. G. Wood, "Magic Lanterns: How Made and How Used," by A. A. Wood, F.C.S. This, the fourth edition of a useful book of 136 pages, illustrated, has been revised, with additions.——From Messrs. Iliffe and Sons, "Photography applied to the Microscope," by F. W. Mills, with a chapter on "Mounting Objects," by T. Charters White. The author explains that his object has been to supply a practical guide to instruct microscopists in the application of photography to their science, and at the same time acknowledges his indebtedness to Mr. T. Charters White and V. A. Corbould for assistance.——From the same publishers we receive "Photographic Pastimes," by Hermann Schnauss (translated from the second German edition). As we remarked in reviewing the German edition, the matter of the work is much more interesting and instructive than its title might lead one to suppose. The first chapter relates to photographing specialities; the second, curiosities; the third, photographing by means of peculiar arrangements; the fourth, photographic optical entertainments; and the fifth, entertainments with photographic prints. The book is plentifully illustrated.——*Funny Folks* for Sept. 17th, to hand, contains the first illustration of the "Comic Camera," an amusing feature to be introduced into its pages. The subject alluded to is entitled "Buffalo Bill in the Back Garden; an Improvised Wild West Scene." As will be noted elsewhere, our contemporary invites contributions of humorous photographs.

## Correspondence.

LANTERN SLIDE EXHIBITIONS.

Sir,—I think it my duty to inform hon. secretaries of the photographic societies of the United Kingdom who are making arrangements for lantern slide exhibitions during the coming winter, that the Boston Camera Club, U.S.A., have sent us another lecture, entitled "The Yosemite Valley," prepared by members of the California Camera Club.

This is a gift to the amateur photographic societies of Great Britain on the same terms as "Illustrated Boston," "The White Mountains of New Hampshire," and "In and about Columbus."

There are now four complete lecture sets of about eighty slides each, with accompanying lecture neatly mounted in type, of American scenery, in free circulation among photographic societies in this country, and which can be lent on application to me.

The only conditions are, that the carriage of the boxes be paid at least one way; that an account of the lectures and press notices of the same be posted by societies at once to Wm. Garrison Reed, 25, Kilby Street, Boston, U.S.A., the manager of the "Interchange of Illustrated Subjects"; and that the greatest care be taken of the slides, any accidents to which, as far as possible, to be made good, and the same reported to me immediately. E. M. Tunstall, *Hon. Sec.*

*Liverpool Amateur Photographic Association*, 3, *Lord Street, October* 10*th.*

## Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting of this Society held on the 8th inst., Mr. J. Barker occupied the chair.

Mr. J. S. Teape said that at a former meeting a plate which he had shown, illustrating the effects of several backings, was objected to on the ground that the caramel backing was not dry when exposed. He now brought forward a plate exposed in the same manner, but prepared in three divisions. One part had been coated with caramel and dried; another had been backed with burnt sienna and dextrine and dried; and the third backed with caramel and not dried. He found that part coated with caramel to be free from halation, whilst the burnt sienna showed a little, and the wet caramel rather more halation. He found, therefore, that his failure to get the best result with caramel was due to his having exposed before the backing was dry.

Mr W. E. Debenham said that this result was in accordance with his own experiments, the high refractive power of caramel rendering it especially efficient.

Mr. Teape also showed some plates which had been exposed under negatives, and completely reversed merely by over-exposure. They were exposed to the light from 30 inches of magnesium wire burned at a distance of 12 inches. They were developed with hydrokinone by Thomas's formula, except that 11 ounces of the hydrokinone solution had been taken, and 5 ounces of the soda solution. As soon as the image began to appear he had added 4 grains of potassium bromide to the developer. The resulting negatives were considered by several members to be the best instances of reversed negatives obtained by simple over-exposure that they had seen.

Mr. Atkins showed an iris diaphragm which he had made. He dissected it to explain its working. A model in paper showed by its translucency the position of the several leaves at all stages of aperture.

The Chairman hoped that this and other societies would stir in the matter of the new impurities now added to methylated spirits. He thought it a serious drawback to several photographic processes, and that something might be gained by proper representations to the authorities.

Mr. Howson then showed a number of prints on gelatino-chloride printing-out paper, manufactured at Ilford, and demonstrated the toning and fixing of the prints. The photographs were of several kinds of surface, from the matt effect produced by stripping from ground-glass, to the enamel glaze obtained by drying in contact with ordinary glass. The toning used and recommended was the sulpho-cyanide bath containing $2\frac{1}{2}$ grains of chloride of gold, and 30 grains of sulpho-cyanide of ammonium to 16 ounces of water. A combined toning and fixing bath was also described, but there seemed to be doubts as to the permanency of the prints compared with those toned in the separate sulpho-cyanide solution.

The Chairman considered that thorough fixing was essential to permanency. He showed some prints made by the gelatino-chloride process which he had introduced at the Society in March, 1885, and which he then exhibited. They did not now show any trace of fading.

Photographic Society of Ireland.

The first meeting of the session was held on the 9th inst. at 15, Dawson Street, Dublin, Mr. George Mansfield, J.P. (president), in the chair.

After the usual formal business, the President read his opening address, in the course of which he said that it was pleasant to meet again after another year, and, above all, to find then that the Society had continued to progress. Of course, to the outdoor photographer, who sought his pleasure in the presence of nature, the ending of the sunny days and the rapid closing in of the chilly evenings brought a pang of regret. There was, however, plenty for him to do during the winter season, were it only to bring before the Society's meetings some of the useful experience he had acquired during his summer work. The field of photography was a large one; there were paths of research in it suited to all tastes. He thought an error had been largely committed during the past two years by the overwhelming amount of encouragement given to the art side of photography. He was a firm believer in the art future of photography, but he was also convinced that, as in other forms of the art of delineation, so also in photography, artists in the true sense of the word have been, and always will be, few and far between. The other uses of photography, therefore, equally deserved their attention, and they were bound to welcome the many who, neglecting the higher walks of art photography, regarded it solely from a scientific point of view, whether as a mere branch of physical or chemical science, or as applied to some of the arts or sciences—such as astronomy, microscopical research, architecture, or archæology. Mr. Mansfield mentioned the fact that an exhibition of members' work would take place in the rooms in December. Speaking of the more general adoption of eikonogen as a developer, particularly for instantaneous exposures, the President's own experience was that for short exposures it was unsurpassed. In printing there had been an increase in the employment of gelatino-chloride printing-out papers. The chairman concluded his address by pointing out that celluloid films had come into more general use, and that where it was necessary to reduce weight they were invaluable.

The meeting then became conversational.

Holborn Camera Club.

*October* 9*th.*—Mr. James Rennie, jun., in the chair.

Mr. Ernest Benest gave a lecture, with experiments, on "Light and its Action on the Haloid Salts." His reason for treating on this subject was due to the fact that he thought a large number of practical workers were very careless about the fundamental principles upon which their art or craft depended. He divided his paper into two sections and an appendix. In the first section he treated of the conditions and materials necessary for receiving the latent image, by noting the various processes, viz., the Daguerreotype, the wet plate process, the gelatino-bromide process, and the collodion process. In section two he dealt with the action of light on these substances. He thought it would be well to consider in the first place:—Is the action of light on the haloids chemical or physical? The general opinion on the action of light was rather favourable to what was known as the sub-haloid theory. He gave various reasons which tended to confirm this theory, as against the theory of a physical change. He then mentioned the oxy-haloid theory, and the experiments of Hunt and Meldola in that direction. He spoke of the ripening of the emulsion, and the various sensitiveness in the haloid salts. In the appendix he made note of the various experiments which he made after the lecture in support of the theories he had put forward.

On Saturday, the 10th inst., it had been arrauged to have a club outing to Hyde Park, aud finish up with a smoking concert at the club rooms in the evening. Owing to the rain, the former portion of the programme was adjourned till next Saturday, while an enjoyable evening was spent in keepiug up the latter event.

### CAMERA CLUB.

THE first technical meetiug of the winter session took place on October 8th, when Mr. STROH occupied the chair.

The HON. SECRETARY handed round some examples of coloured photographs lent for exhibition by the Art Colour Photograph Company. In these the paper print is rendered translucent, and the colouring is done roughly from the back. Some improvements in the method are claimed so that the work can be done with certainty and ease by unskilled hands, the photograph giviug all the modelling.

Capt. ABNEY, in a paper on "Light and Lights," dealt with and compared the visual and photographic values of certain lights—sunlight, gas, electric light, and magnesium light—and showed that practically sunlight and the arc electric light alone are available for printing purposes. He then proceeded to describe very simple arrangements for enlarging by these lights direct upon platiuotype paper, and illustrated his remarks and directions by a large number of excellent examples.

The lecture excited great interest, and mauy questions with some discussion followed the paper.

On October 19th, the first of a series of elementary lessons will be given by Mr. Lyonel Clark, the subject being "Lenses"; and on the 22nd the subject will be "Reversal," when Mr. Henry Sutton will give a paper with illustrations and demonstrations.

### PUTNEY PHOTOGRAPHIC SOCIETY.

*October 7th.*—Rev. L. MACDONA in the chair.

The following were elected to serve on the council for the ensuing term: *President*—The Hon. Barou Pollock; *Vice-Presidents*—Rev. L. Macdona, Dr. W. J. Sheppard; *Council*—Dr. J. F. Farrar, Messrs. H. Faulkner, jun., T. Gilbert, W. F. Gorin, and L. S. Zachariasen; *Hon. Secretary*—Mr. Chas. Ballard, 45, Disraeli Road, Putney; *Hon. Treasurer*—Mr. Wm. Martin, jun., 4, Lower Parkfields, Putney.

### RICHMOND CAMERA CLUB.

AT the meeting on the 9th inst., Mr. ARDASEER in the chair, a discussion took place on the subject of "Blisters on Silver Prints, &c." Various remedies were suggested, but uo one had had the courage to essay the prescription to be found in the "American Journal of Photography Annual" for 1890, viz., to fix the prints in a nearly boiling hypo bath, aud thence transfer to a solution of salt strong euough to float a potato!

The CHAIRMAN gave the different theories by which blisters iu prints are commonly accounted for: viz., first, the change of temperature from oue bath to another, the remedy for which is obvious; secondly, the difference iu density of the successive baths, a remedy for which is to thoroughly drain the prints at each transfer; thirdly, the generation of carbonic acid gas by some unexplained means in the hypo bath, which may be prevented by the thorough washing of the prints between toning or development and fixing, and the additiou of ammonia to the fixing bath; and fourthly, the use of too stroug a hypo bath, a solution of 1 in 8 being quite strong enough.

### CROMWELL PHOTOGRAPHIC CLUB.

THE adjourned meeting of this Club was held at the Cromwell Hotel, Great Yarmouth, on Monday evening last. The following, amongst many others, were made members:—Messrs. J. W. De Caux, J.P., C. Stacey Watson, A. S. Cooper, and H. E. Hurrell. Miss V. Buxton, of Frittou Hall, was elected one of the vice-presidents. The rules of the Club were passed, and other business transacted.

It was decided that the first Club meeting, to be held on November 9th next, should be a beginners' evening, iucluding exhibition of photos, short display of members' slides, the reading of a paper on elementary photography, with a discussion to follow, and at intervals music and singing.

It was announced that fifty members had joined the Club at the close of the meeting.

### LEEDS PHOTOGRAPHIC SOCIETY.

AT the meeting on the 1st inst., Mr. GODFREY BINGLEY in the chair—

Mr. H. M. SMITH delivered a lecture, with lime-light illustrations, on "Film and Kodak Negatives, and Lantern Transparencies therefrom." The slides included some remarkably fine examples by Mr. and Mrs. A. R. Dresser. A number of those by Mrs. Dresser were fine interior and architectural photographs. The majority of the pictures shown were, however, instantaneous exposures. The lautern slides themselves were on collodio-bromide plates, aud were of excellent quality and tone.

### ROTHERHAM PHOTOGRAPHIC SOCIETY.

THE second annual meeting was held on October 6th, Dr. BALDWIN (president) iu the chair.

The report of the council recorded a steady growth in the membership, and an increasing iuterest in the aims aud objects of the Society. The number of financial members was thirty-three, as against twenty-seven last year. For the coming year an attractive programme was in course of preparation. There was a satisfactory balance in hand after discharging all liabilities.

Officers were chosen as under:—*President*—Dr. F. B. J. Baldwin; *Vice-Presidents*—Messrs. E. I. Hubbard, W. H. Hay wood, and G. T. M. Rackstraw; *Treasurer*—Mr. J. Leadbeater; *Hon. Secretary*—Mr. H. C. Hemmingway; *Council*—Messrs. L. Berry, J. Wright, W. H. Shephard, W. Mason, J. W. Whittington, and the officers.

Several alterations of rules were made, and the word "amateur" was removed from the name of the Society. Eleven new members were elected, bringiug the total to forty-six.

Afterwards Mr. E. I. HUBBARD demonstrated the working of gelatiuo-chloride paper.

### HUDDERSFIELD PHOTOGRAPHIC SOCIETY.

ON the 7th inst. the above Society held a special meeting, Mr. A. CLARKE in the chair.

Mr. H. M. SMITH, of the Eastman Photographic Materials Company, gave a lantern entertainment—slides from kodak negatives. He commenced by describing the kodak camera, and, having shown the mechauism of the roll-holder, he said that some people object to its use on account of their having to expose the whole of the film before commeucing to develop. This, he contended, was a fallacy, as one, two, or more negatives can be detached, aud the film refixed in the holder. He stated that though the camera is designed principally for hand or instantaueous work, yet it is capable of beiug fixed on a tripod and used in the ordinary way.

### OXFORD PHOTOGRAPHIC SOCIETY.

THE annual meeting was held on October 6th, in the Society's new rooms in the High Street, Mr. Councillor J. H. SALTER in the chair.

The Secretary read the report of the committee for the year, from which it appeared that the Society was in a flourishing condition. Thirteen members had been elected during the year, which was considered satisfactory. The committee had been successful in acquiring two rooms for the daily use of the Society, in the principal street of the city, at a moderate rent. The advaucement of photography, the committee urged, should not be difficult in a place with such facilities for learning as

Oxford, for there could be no place of its size where more was done in photography, and where lanterns must be in use hundreds of times in a year. The dark room is well fitted up, and nearly every British photographic periodical is on the table in the meeting room. Various schemes were proposed for the coming season, among which was Mr. Stanley Kent's proposal to establish a library of lantern slides.

The following officers and committee were then unanimously elected: *President* (for the third year)—Mr. E. A. Ryman-Hall; *Vice-Presidents*—Messrs. C. C. Cole, A. F. Stanley Kent, M.A. (Magdalen College), A. F. Kerry, M.A. (Exeter College), and Councillor J. H. Salter; *Hon. Treasurer*—Mr. J. Minn; *Hon. Secretaries*—Messrs. F. A. Bellamy, F.R.M.S., and H. Minn, 136, High Street; *Committee*—Messrs. N. G. French, W. J. King, G. W. Norton, H. M. Phillipps, A. Robinson, G. A. Smith, and Rev. W. H. Price, M.A.

Five names were read for membership.

Sheffield Photographic Society.

The annual meeting was held at the Masonic Hall, Surrey Street, on October 6th, with Mr. B. J. Taylor in the chair.

The Treasurer presented his statement of accounts, which showed a considerable balance in hand.

The Secretary read his report of the proceedings for the year, showing that there had been three resignations, and twelve new members. The Society was never in a more flourishing condition than at present, and the proceedings had been characterised by an amicable tone throughout. The excursions had received considerable attention and support, and had been much more numerous than for several years past. They had produced some splendid work, especially the one to Lincoln.

The officers for the ensuing year were elected as follows: *President*—Mr. B. J. Taylor (elected for the third time); *Vice-Presidents*—Mr. G. Bromley and Mr. Thomas Frith; *Council*—Messrs. Ed. Sampson, W. T. Furniss, W. V. Davy, Josh. Smith, and T. G. Hibbert; *Treasurer*—Mr. Ernest Beck; *Reporter*—Mr. E. H. Pearce.

Lewes Photographic Society.

At an ordinary meeting of this society, held at the Fitzroy Library on Tuesday week, Mr. J. G. Braden, the president, occupied the chair. The sets of prints from hand-camera negatives sent in to the quarterly competition were on view. Mr. J. Hunter Graham, a member of the Brighton Photographic Society, as judge, awarded the certificate to the set belonging to the hon. secretary, Mr. E. J. Bedford.

The President then gave "A Few Notes on Exposure," and in his introductory remarks expressed the hope that all members would bring with them not only their good work, but also their failures, for he thought that often more might be learnt from a failure than a success. He said to produce a perfect negative it was necessary to give the correct exposure. He had brought Watkins' exposure meter, which he fully explained, and said that after a series of experiments he had made with the instrument, he had come to the conclusion that it was a very great help to photographers in ascertaining the exact exposure required for any subject. He showed examples exposed in accordance with the meter, which seemed to be perfect, though they were subjects which differed very widely in the time of exposure required.

Mr. Percy Morris proposed, and Councillor Wightman seconded, that a Watkins' exposure meter be given as a prize to the member who should produce the best results in some future competition, which was carried unanimously.

Photographic Veneering of Furniture.—In the application of photographs to cabinet-ware, Mr. J. K. France has patented the use of a substance that he calls "pyralin, or some other compound of pyroxylin." The print is fixed by means of alcohol. It is applied to the wood to be decorated, and the surface polished by pressure on a metallic plate, or by other means. This invention has for principal object the veneering of furniture.—*Wilson's Photographic Magazine.*

## Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

Sam.—*Sticky Black Varnish.* Your unfortunate experience does not admit of more than partial remedy. It will, of course, be impossible to restore the torn films, but in the event of your having any more negatives which have been treated in the same way, you should either print them through a sheet of mica, or rub them over with starch powder, which will only adhere to the tacky portions. With respect to fresh negatives and future work, you may get good results by rubbing into your present varnish some lithographers' Frankfort black, and then thin down with pure benzol, by which its drying properties will be vastly improved without loss of opacity. *Re-Bronzing Lens Diaphragms.*—Clean the worn surfaces by rubbing with a cloth moistened with dilute ammonia; when dry, brush the metal over on both sides with a warm solution of chloride of platinum, drop them into hot water, wash well, and dry. Finally, rub them over with powdered black-lead to make them slide easily.

Old Subscriber.—*Bromide Enlargements to Take Oil Colours.* See Messrs. Morgan and Kidd's catalogue, page 5, for sensitive coated canvas on wedged stretching frames; or you may prepare your own canvas with bromide emulsion. The treatment of a bromide paper print to make it take oil colour would be very unsatisfactory, for the coating with distemper must inevitably hide much of the photographic detail.

Enquiry.—*Photo-Mechanical Prints.* The Direct Photo-Engraving Company (Messrs. Hoffman and Co.), Barnsbury Park, N.; The Meisenbach Company, 188, Fleet Street, E.C.; Messrs. Husnik and Hausler (agent: F. C. Clarkson, 4, Fenchurch Avenue, E.C.).

H. B.—*Tremors from Passing Traffic.* Before proceeding to make another move, try the method of slinging the whole apparatus, enlarging camera and copying frames, as is often done in large city establishments to overcome vibration.

F. P.—*Bank-Note Security.* Instances have not been wanting of late to prove that cheques and some bank-notes are being tampered with, and your newspaper cutting is but another evidence of the fact. Before long a bankers' commission may possibly be appointed, or you might at once communicate with Sir John Lubbock.

Printer.—*Silver Print Trimmings and Waste.* The burning of albumenised paper in large quantities must always be a bit of a nuisance. The unpleasant odour might be partly mitigated by soaking with nitre or nitrate of soda solution, drying, and then setting fire to small parcels in succession. The heap of refuse or ashes thus obtained should now be fused with more carbonate of soda to recover the silver in the ordinary way.

F. R. A. S.—*Sun Photography.* A week ago the sun's disc showed a large group of spots in the southern zone, with a smaller single spot high above them. The Woolwich telescope, with which our photographs were formerly taken, was furnished with a lens of fully 4 ins. aperture, and 6 ft. 5 in. focal length. The image of the sun measured, in July, exactly ·7 in. diameter. The chemical and visual foci did *not* coincide, but differed by about two inches. Exposure was instantaneous for collodion with a quarter-inch stop, so that no clockwork or "following machinery" was required, the finder enabling us to keep the sun's disc in view. For working details, see the *Photographic Journal* of November, 1860. The Kew results, in later times, were in every way superior, but, given a perfectly sharp negative of small dimension on a structureless film, there should be no difficulty in enlarging to two or three diameters.

Wymondham.—*Flattening Albumen Prints.* By passing through a rolling press, or merely dragging them, face upwards, over a sharp-edged table, the tendency of the print to curl inwards may be counteracted. With regard to the other matter, your kind letter of thanks is a sufficient reward.

THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1729.—*October* 23, 1891.

CONTENTS.



## ON PHOTOGRAPHING CRIMINALS.

It has often been said, and still more often printed, that one half of the world does not know how the other half lives. Surely we may parody this sentence, and say that one half the people who visit the photographer's studio have not the least idea under what circumstances the "seamy side" of life is photographed, and has its pictures taken without charge. On one side we have the lady of fashion, or the butterfly of fortune, driving up to the sumptuously furnished studio of the West-End photographer, bent on looking their best, and thinking what an impression their portraits will presently make on an admiring public. On the other, the wretched criminal who hates the sight of the camera, and who will do his best, by sundry contortions of his features, to render the likeness as little like him as possible.

As everyone knows, photography is practised in all our prisons, and every criminal, whether he likes it or not—it is generally not—has his portrait taken as a means of future identification. It is difficult to get a view of these criminal photographs—perhaps we should say it is impossible—although why this should be the case it is hard to say. To the unofficial mind it would seem that, to make these pictures really valuable in advertising the countenances of those who prey upon their fellow mortals, they should be open to the public—of course, under certain restrictions. But to keep them locked up in the privacy of a prison or police office is ridiculous. One exception to this rule was made, we remember, some years ago, when a number of criminal photographs were shown at the Pall Mall exhibition, but we fancy that this was initiated by the photographer and not by the authorities. These pictures were good ones, but we believe that the majority of such works, which are photographed at a very low contract price, are far from being works of art, and may be called diagrams rather than pictures. And in point of fact, these portraits need not be pictures. To be of use in identification, they merely require to portray the leading characteristics of the face, and to bring into prominence any marks, such as scars, moles, or slight malformations. It has been often pointed out, but we do not know whether the suggestion has been acted upon in this country, that a criminal's hand, both back and front, should be photographed as well as his face. On no two hands are the surface markings identical, while slight malformations of the digits or nails will often show that a man follows some particular trade. There are few men, too, who go through existence without having at some time cut or otherwise maimed their hands, and, as is well known, these scars persist through life.

The prison photographer has by no means an easy task before him, for many of his models, knowing the use to which the coming picture is to be put, will try their hardest either to prevent it being taken at all, by kicking and plunging while the exposure is being made, or they will, by "making faces," endeavour to render the portrait unrecognisable. A case of this kind came up the other day, and gave the *Daily Telegraph* an opportunity of a jocose paragraph on the subject. A man named William Howes, who had distinguished himself by nearly killing a policeman, and had given other indications which made his friends believe that he was qualifying himself for the attentions of the common hangman, objected, while in gaol, to having his photograph taken, when, in order to make him obedient, he was pinioned and held by half a dozen warders before the camera; but it was no use, and the work had to be left undone. This is by no means a solitary case. In a very interesting volume, called "Professional Criminals of America," by Inspector Byrnes, of New York, there are many such cases recorded; indeed, the frontispiece of the book represents a man struggling in the hands of four warders while seated before the camera.

Very few of our readers, possibly, have ever heard of this volume, for there are not many copies in this country. The book contains about three hundred portraits of men and women who have made themselves notorious in New York, and who are well known to the police of that city. It is most interesting from a photographic point of view, as well as to those who care to study physiognomy. Each portrait is accompanied by a short history of the original, and, curiously enough, the deepest dyed villains are by far the most presentable looking men. The majority of the portraits, in fact, have very little trace of villany about them. Some are grave, some are jolly, and mostly they are pictures of respectable looking folk such as one rubs shoulders with in church, or in any other public assembly. It is when one begins to study their records that it is discovered what rogues some of these fellows are, and how they prefer crooked ways to those which are straight. Here are thieves of all kinds, some of whom have been tried for murder as well, pickpockets, bank-safe burglars, "confidence" men and women, house thieves, hotel and boarding-house thieves, receivers of stolen goods, and forgers. And, as we have said, these birds of prey are, according to their photographs, respectable members of society. Could the famous Lavater, we wonder, have detected the rascal beneath these fair exteriors, or are we ourselves sadly deficient in our powers of judging by appearances?

"Is it usual for criminals to be so trim?" asked a reporter of Inspector Byrnes. The answer is to the effect that, as a rule, thieves attire themselves so as to attract the least attention from the class of people among whom they wish to carry on their nefarious business. If among poor people, they dress shabbily; among the well-to-do they dress stylishly. Their great aim is to escape notice, and to appear like the crowd among whom their lot is cast. We read, for instance, of a couple of worthies—man and wife—whose business it was to pick pockets at wakes and funerals. They, of course, dressed in sable, and were the most solemn looking couple it was possible to imagine. There is something intensely grim in the thought of these rascally "mourners" picking pockets in the shadow of death, and robbing those stricken with grief. Could human meanness descend to a lower pitch than that? The author of this interesting volume tells us that, although a number of his clients have endeavoured to cheat the photographer by making grimaces, as a rule the pictures of these artful ones are quite sufficient to identify them by. In one example, a criminal who defeated every attempt of the photographer was eventually taken while asleep, and his picture, with head on pillow, is duly reproduced.

But why, in these days of quick plates and rapid lenses, should there be any difficulty at all in getting first-rate pictures of these public characters? Surely it would be the easiest thing in the world to have a concealed camera pointing to a well-lighted seat in the open air, where the criminal whose portrait was wanted could be invited to sit for a few moments. Give him a newspaper to read, say, with an account of his own "case" in it, and, while he is absorbed in the narrative, let the warder call him by name. As he raises his face with a natural expression on the features, let the trigger of the shutter be released, and a good portrait would be the result. But there is so much red tape about all official acts that probably the old, clumsy way of taking criminal photographs will continue to be followed, notwithstanding the gain that would accrue from adopting the better plan.

## PHOTOLYTIC ACTION IN RELATION TO SOLUTION.

BY F. C. CROSS.

We shall not, we hope, be considered disrespectful to the amateur photographer if we regard him as a devotee of light science. He is, in fact, so much absorbed in the practice of a delightful art as to have little time left for a serious study of such incidental matters of science as light and chemical action. We are free to confess with him a very substantial ignorance of these subjects, more especially the former; but we feel—the more so, perhaps, on that account—a distinct call to rush in where the light philosopher hesitates to tread, and to discuss one or two bearings of the fundamental phenomena of photographic action which he—we were going to say—appears to overlook, but should rather, perhaps, say prefers to suspend his mind upon. We are the more emboldened to carry our exploring rushlight into the obscurity of this region of physical science, in observing the regard paid by writers on the subject of photography to the excellent injunction of a modern authority: "If you want to learn something of a subject, write about it." This is very much our attitude in attempting to forecast the directions in which the study of photographic action will contribute in the near future to important developments of physical science. Up to the present this distinction cannot be claimed for the camera, notwithstanding the powerful mechanical aid which it renders to science. In fact, the amount of exact knowledge which we possess of the molecular mechanism of photographic action is quite remarkably disproportionate to the enormous development of the *art*, of which such knowledge might very well be supposed to be the necessary basis. But in this, as in many other growths, practice has far outstripped theory, and the photography of to-day presents an elaborate and intricate system of preparation and manipulation of the photo-sensitive surfaces, with a request to all who may have the taste for the uphill work of investigation to be good enough to refer the countless details of practice each to its corresponding scientific basis.*

A very elementary analysis of the phenomena of photographic action shows (1) that they represent only a minute fraction of the molecular decompositions which are known to be occasioned by light; and (2) the photo-sensitiveness of a compound is very materially affected by the medium through which it is distributed for the preparation of the photographic surface. There is certainly, it will be observed, nothing very striking—or, rather, strikingly new—in these conclusions; but it is just those to whom this observation would occur who, perhaps, fail to see their cardinal importance, and that through each there opens up a vista of the science of the future in which the study of photographic action will play an important part. What these are we proceed to show, duly apologising to those to whom our conclusions, and the forecast of their development, may seem familiar.

*Light* is the physical cause of life. The ultima ratio of our existence is the constructive activity of the plant cell,

* Comp. Meldola, "Chemistry of Photography," page 2.

and the work of the cell in elaborating its countless products obviously depends upon the *special conditions* under which radiant energy on the one hand, and the inorganic building materials (carbonic acid, water, and nitrogen compounds) on the other, are brought together; and the first condition is necessarily that of *solution* in the special or protoplasmic medium provided by the cell.

We would premise here that the terms "photography" and "photographic action" are aggregate expressions for the result of the familiar series of operations by which the light-picture is evolved. To express the fundamental decomposition upon which such apparently dissimilar operations as photography and the work of the plant cell depend, we want a new term, and we shall be guilty of no startling innovation if we employ the word "photolysis," or "photolytic action."

Photolytic action, whether in the plant cell, or in the camera, or printing frame, is essentially the same. It is a separation of elements, or groups of elements, from one another, a cleavage of the molecule of a compound brought about by radiant energy; and the necessary condition for this communication of force, or the conversion of radiant energy into molecular or atomic motion, is the distribution of the decomposable matter through a suitable medium. This medium in the plant cell is the living protoplasm; in the photo-sensitive mixture it is the collodion, gelatine, or other colloid vehicle. The precise function of protoplasm in determining the photolytic decomposition of carbonic acid must remain, for the present, a matter of speculation; not speculation, however, of the nature of wild conjecture, but governed by the analogy subsisting between this *chef d'œuvre* of nature herself, and those decompositions which the photographer has adopted as the basis of his art. In the latter, we have to do for the most part with complex mixtures, and the part played by the colloid medium or vehicle is by no means simple. While, however, the photolytic decomposition of the silver haloids in gelatine emulsion may be taken as the very foundation of the photographic *art*, the complications in the reactions both in the formation and development of the image, are such that this process would by no means come first in the order of a scientific development of the subject of photography. As the *simplest* type of process, on the other hand, giving a clear illustration of the essential factors, we cannot make a better selection than the diazotype method of printing in primuline derivatives. The photolytic decomposition of diazotised primuline is an extremely simple reaction, the chemistry of which need not, in view of recent publications (*Jour. Soc. Arts; Jour. Soc. Chem. Ind.*), be again expounded. The point which we wish to insist upon is, that the instability of the compound varies greatly with the condition of its exposure to light. The free compound, in fact, is comparatively stable, but when diffused through colloid media it is decomposed with extreme rapidity. In the science of but a few years ago this would have appeared a very anomalous result, and for this reason: the affinity of primuline for the organic colloids is such that not only do they freely remove it from aqueous solution, but in doing so form with it a combination which withstands the action of strong hydrolytic agents, which combination is unaffected by the conversion of the primuline into its diazo derivative. We should have argued that combination means fixation of molecules—*i.e.*, increased rigidity—and that diazo-primuline combined with cellulose, for example, would be more resistant to photolytic action than the compound in the free state. The facts necessitate the exactly opposite conclusion: the combination of the diazo-primuline with the fibre substance confers molecular mobility; and what is true of the combination with cellulose holds also, in varying degrees, with the lignocelluloses (wood, and such fibres as jute), silk, wool, gelatine, and, in fact, the "organic" colloids generally.

The explanation which we shall now endeavour to set forth supplies one of the important points of contact of photography with the molecular science of to-day.

According to the modern theory of solution, a substance dissolved in a liquid menstruum is molecularly in precisely the same condition as when gasified or vapourised —*i.e.*, the molecular aggregates composing the substance are entirely resolved into, of course, the unit molecules, and these are endowed with the same mobility as gaseous matter. The theory—or, rather, generalisation of the observed properties of solutions—asserts further that when the dissolved substance is an electrolyte—*i.e.*, is a conductor of the electric current, at the same time undergoing decomposition into its constituent elements, or groups of elements—there occurs in the process of solution a partial decomposition, identical in character with that produced by the electric current.

It is not difficult to see the very important bearing of this theory upon photographic processes generally. The silver haloids in a gelatine emulsion are in a state of solution or semi-solution, and therefore incipient *dissociation*, and, the dissociation or cleavage of the molecule being of the same character as that produced by photolytic decomposition, an unstable equilibrium is produced which the shock of the waves of "light" upsets with the astonishing rapidity of the modern gelatine film. But in silver photography, both with the formation of the image in the camera and its subsequent development, the phenomena are extremely complex, and it is impossible to say how much of the high order of sensitiveness attained is actually due to the special condition of solution of the haloid in the gelatine of the film. In the several printing processes the phenomena are less complicated, and in the primuline process the simplest order of things obtains. We have, of course, nothing like the sensitiveness of the gelatine silver film; but then we are not dealing with sensitiveness *per se*, but as influenced by a particular factor—*i.e.*, the variation in sensitiveness of a photolyte (if we may use the term)—according to its relationship to the film medium through which it is diffused. The simplicity of the process, considered scientifically, contrasts with other printing processes in which the silver haloids are used in the following points. The fundamental decomposition is a perfectly definite one—*i.e.*, has been exactly or quantitatively accounted for; it is not complicated by secondary reactions of the products of photolytic decomposition; the development of the image consists in a simple combination of the diazo-primuline, which, by survival in inverse proportion to the action of light in the several parts, constitutes the image, with certain bodies, themselves colourless, to form colouring matters. We will save the reader a more laboured argument of the proposition to which these considerations are leading up, and content ourselves with formulating it: A fabric (*e.g.*, cotton or silk) or a gelatine film impregnated with diazo-primuline hold this compound in a condition of *solid solution*; in other words, its molecular state, when in combination with or dissolved in these colloids, is that of disaggregation into units, and therefore of maximum mobility, which is the condition of maximum sensitiveness to photolytic decomposition.

We have cited only one illustration in support of this proposition, and we have assumed on the part of our readers a certain acquaintance with recent contributions to one of the most interesting developments of molecular science, which this theory of the nature of solution certainly is. Our object is to suggest the important contact which is imminent between two branches of molecular science, which up to now have been independently developed, and the probability, nay certainty, of reciprocal stimulus, our grasp of photolytic decomposition gaining much in precision from a more exact estimate of an important factor, and the theory of solution deriving important confirmation from the phenomena of photographic science.

But if this is true of the limited range of photolytic decompositions available for picture making, how much more must the interdependence of *light action* and *solution* obtain in the sphere of activity of the plant cell? We know, of course, a good deal of the proximate results of this activity; the range of carbon compounds of which the modern chemist can give a complete account—complete in the sense that he can build them up from their simplest beginnings—is a formidably wide one; but all the chemical dictionaries, laboratories, and manipulative skill of the world fail to throw even a ray of light on the superb economy of the plant cell.

We are certain, however, of the two most important physical factors of its activity. The function of light we take as an axiom; but the function of the protoplasmic solution—whether of the aboriginal materials for the synthetic work of the cell, or of its proximate products—is as yet an absolutely closed book. The new light which we have on the molecular condition of substances in solution should enable us to form some more definite conjectures as to the probable condition of matter when dissolved in protoplasm, and of the complementary function of photolytic action upon matter so dissolved. We shall, perhaps, be betraying confidences if we introduce the name of one of our distinguished leaders in science—Prof. Thiselton Dyer—as having definitely suggested to us this particular view of a probable function of protoplasm. The suggestion, we think, is a fruitful one.

We have endeavoured to develop the conception from the point of view of photographic action. Without any attempt at peroration, or even rounding off our lucubrations with any formal prophetic anticipations, we are satisfied to have made the endeavour ourselves to progress from the more to the less vague in our conception of photographic and photolytic phenomena, and their connection with current developments of molecular science.

The first town council of Greater Vienna has just been photographed by Angerer. The mayor's table, with papers on it, forms the middle of the picture; at it one sees the mayor (Dr. Prix), the two deputy mayors, and round them the town councillors. Two large and two small pictures were taken. A copy is to be deposited in the city archives.

We have received from Messrs. Marion and Co. a very choice assortment of Christmas and New Year Cards designed for mounting photographs upon. These are most artistic in design, and are beautifully printed in the most delicate tints. The cards are made in various sizes, from "midget" up to whole-plate. They will accommodate both upright and oblong pictures, and, while some are made to take pictures already mounted on card, others require the photograph to be attached with mounting medium. No prettier form of Christmas or New Year's greeting can be imagined than one of these tasty cards mounted with a picture identified with the sender, or appropriate to the recipient.

## Reviews.

The Gelatino-Chloride of Silver Printing-out Process. By Walter E. Woodbury. (*Hazell, Watson, and Viney, Limited, London.*)

In this little book Mr. Woodbury gives full directions for preparing emulsion and coating paper for the gelatino-chloride process, which has recently become familiar to photographers under the names of aristotype, celerotype, Obernetter, &c. The directions are plainly given, and, so far as we can see, they are trustworthy. It is a pity, however, that the book is cut up into so many small chapters, two or three of which consist of less than a page of matter. The addition of an index would also be desirable in another edition of the work. The book is well printed, and will be welcome to all who are fond of trying various printing processes.

One Hundred Photographic Formulæ. By W. Ingles Rogers.

This is a mere compilation of formulæ which have been published in the various photographic journals and annuals, and it can hardly pretend to be anything else. If the compiler had given some idea of the results obtained by using the different recipes—such, for instance, as the colour given to the film by each developer, or the best developer to use for certain plates, or under given conditions—the republication of the matter in this form would have had something to recommend it.

## THE FIXING BATH.

BY J. J. HIGGINS, A.M., M.D.

A plain solution of hyposulphite of sodium in water, ranging in strength from 1·4 to 1·6, has until recently been the sole accepted and usual fixing bath for photographic negatives. Of late, however, modifications of this bath have been brought forward and highly extolled. The principal of these are, first, that in which carbonate of soda (the ordinary sal. soda, or washing soda of the shops) is added to the simple solution of hypo, and known as the "sodic hypo bath"; second, that in which alum is added, known as the "alum hypo bath"; third, that in which carbonate of soda and alum both are added, known as the "sodic alum hypo bath"; and again, that in which sulphite of soda, with an acid, is added, known as the "acid sulphite hypo bath." This last is remarkable for the almost sparkling, clear, crystal, and jet black negatives produced by or resulting from its use, and I was employing it for awhile with the greatest satisfaction, until, on the printing of a number of the negatives, my attention was called to the fact that my negatives, with which there had never previously been any such trouble, now stained the silver paper. This staining I found was due to *sulphur* present in the film, and it was only by frequently repeated and prolonged washings of hours in length that it could be finally removed.

Occurring almost regularly, and *only* with negatives fixed in acid sulphite hypo (although special attention was now given to, one might say, exhaustive washing), and *not* with those fixed in *plain hypo*, the following series of experiments was instituted by me to determine the proneness of the various fixing solutions to cause or leave this stain, observation at the same time being made of their comparative rapidity of fixing. To avoid the error possible in the use of different plates or films, an 8 by 10 plate *after exposure* was divided into four 4 by 5's, and each of these immersed at the same moment (the baths being all equal in quantity, and likewise strength of fixing salt) in its own fixing bath, and left therein (until each and all were apparently completely fixed) an equal period of time. Then on removal they were similarly washed. The same treatment was accorded to an 8 by 10 plate cut into 4 by 5's, and *not having been exposed.*

The first bath was the *plain bath* of simply hypo and water; strength:—

| | | |
|---|---|---|
| Hypo ... ... ... ... ... | 1 | pound |
| Water ... ... ... ... ... | 5 | pints |

The second was the *sodic hypo bath*:—

| | | |
|---|---|---|
| Hypo ... ... ... ... ... | 1 | pound |
| Sal. soda... ... ... ... ... | $\frac{1}{4}$ | ,, |
| Water ... ... ... ... ... | 5 | pints |

The third, the *alum hypo*, in which alum is added to the first or plain bath, and after the subsidence of the milkiness resulting, decanted or filtered:—

| | | |
|---|---|---|
| Hypo ... ... ... ... ... | 1 | pound |
| Saturated solution of alum ... ... | 5 | ounces |
| Water ... ... ... ... ... | 5 | pints |

The fourth, the *sodic alum hypo*, in which carbonate of soda and alum are both additional:—

| | | |
|---|---|---|
| Hypo ... ... ... ... ... | 1 | pound |
| Sol. of carbonate of soda (sal. soda) 1·4... | 10 | ounces |
| Water ... ... ... ... ... | 5 | pints |

Shake, let settle for an hour or so, decant or filter.

The fifth, the *acid sulphite hypo*:—

| | | |
|---|---|---|
| Hypo ... ... ... ... ... | 1 | pound |
| Soda bisulphite ... ... ... ... | 4 | ounces |
| Acetic acid ... ... ... ... | 5 | fl. drs. |
| Water ... ... ... ... ... | 5 | pints |

In the consideration of these baths theoretically, we have: That, by the addition of carbonate of soda to that of simply hypo and water, we render the bath for a surety alkaline, without altering its nature otherwise. To this practice there is no special objection, many of our older and most experienced operators, both here and in England, adding it, or carbonate or water of ammonia, to neutralise any free acid often present.* That, by the addition of alum, hardening of the film is indeed effected, but, as seen at once, by such very hardening *permeation is opposed*, and *fixation retarded*, while, at the same time, from its chemical composition $(K_2SO_4Al_2(SO_4)+24\,H_2O)$, *weakening* of the bath with manifest *evolution of sulphur* takes place. That, by the addition of an acid sulphite, still greater and more pronounced like results ensue.

E. J. Wall, "Dictionary of Photography," says:—

"The addition of any acid to a solution of hyposulphite will cause evolution of sulphurous acid and deposition of sulphur.

"The alum should be omitted from the fixing bath, as it decomposes part of the hypo, and weakens the fixing powers, besides rendering sulphur deposition liable."

And such is the consensus of opinion of most photographic workers and scientists.

To the foregoing it may be said that "theory is all well enough," but what are the facts? For it goes without question that an established fact outweighs the most elaborate theories, it matters not how many or erudite the authors. Theory, for the most part a mere explanation of observed facts, has here contrarywise been supported thereby; the results of the trials being as follows.

The plates fixed in the acid sulphite hypo were all badly affected with *sulphuration*, and to a less extent, yet very badly, those fixed in the sodic alum hypo. The alum hypo bath gave plates which, although affected, were not so to as great a degree, while the sodic hypo and plain hypo baths gave plates *entirely unaffected.*

The *sulphuration* in the case of the acid sulphite and sodic alum baths was most readily seen on inspection; yet all the plates from each and all of the baths were subjected to the printing test, as several *not showing in the least faulty on examination by the eye*, failed in this, their final ordeal.

In the matter of rapidity, of which observation was likewise made, fixation (here reference being to merely the *visible clearing* of the entire plate; practically, additional time being advisable) was accomplished by the plain hypo bath the quickest of all; by the sodic hypo somewhat slower; by the alum hypo still slower; by the sodic alum hypo slower yet; by the acid sulphite slowest of all, very tedious, and at times unaccomplishable.—*Wilson's Photographic Magazine.*

* As to the effect of free acid in the fixing bath, note subsequently.

## SLOW COMBUSTION OF GASEOUS MIXTURES.

When moist electrolytic gas is heated at 305° in glass vessels over mercury for one to two weeks, combination takes place between the oxygen and hydrogen, and only a very small volume of gas remains; in absence of mercury, combination takes place only very slowly at 305°, and at 448° the diminution of volume is very small, but at 518° a considerable quantity of water is produced. The thin glass bulbs provided with lateral capillary tubes, which were employed in most of these experiments, can be sealed without danger of explosion if a little air is permitted to enter the point of the capillary, but even traces of air or other impurities have such a great influence on the reaction that the results are very variable, and, consequently, the relation between the time and the amount of combination could not be determined.

The temperature of explosion of electrolytic gas, and that of a mixture of oxygen and carbonic oxide in theoretical quantities, lies between 518° and 606° when thin sealed glass vessels are employed.

A number of experiments were made in order to try and determine the rate of combination of oxygen and hydrogen under certain conditions. For this purpose electrolytic gas, generated by the electrolysis of hot water, and consequently free from ozone and hydrogen peroxide, was passed for many days through a series of bulbs fused together by means of very small capillary tubes. The apparatus was very carefully cleaned, the gas was dried with concentrated sulphuric acid, and india-rubber, cork, and all organic substances were carefully excluded; in some of the experiments the bulbs were heated at a faintly dull-red heat, and the pure electrolytic gas passed for eight days. The bulbs were then sealed before a blowpipe, and heated in the vapour of sulphur or of phosphorous pentasulphide (b. p. 518°) under the same conditions. In spite of all precautions, the results of the experiments were very variable, and no relation between time and amount of combination could be determined; it would seem, therefore, that the glass surface, even when most carefully cleaned, has a modifying but variable action on the electrolytic gas, and that this action is sufficiently different, even in the case of two exactly similar bulbs, to cause great irregularities in the experiments.

Bulbs containing pure dry or moist electrolytic gas can be sealed without danger when the capillary tube is sufficiently fine ($\frac{1}{4}$ to $\frac{1}{3}$ mm. in internal and 4 mm. in external diameter); in the case of the moist gas, a small flame can be observed running along the capillary when the tube is being sealed, but it goes out before reaching the bulb; no flame is seen in the case of the dry gas, the volume of which undergoes no appreciable diminution by combination taking place.

The electrolytic gas employed in the above experiments was found on careful examination to be free from any appreciable quantity of air.—*Journal of the Chemical Society.*

## ON THE INTENSIFICATION AND REDUCTION OF GELATINE NEGATIVES.*

BY ROLAND WHITING.

HAVING made these preliminary remarks, I will now proceed to describe the various methods employed for increasing or reducing the printing density of a plate, and, as there is less to say about the latter than the former, I will treat upon that subject first. Reduction of density can be affected in two principal ways: the film can be reduced in thickness by mechanical means or by solution, or the silver forming the image can be changed into some substance which can be dissolved by a solvent. For reducing by the first of these methods, Mr. Debenham recommended the use of ozone bleach. After the plate has been immersed in a solution of chrome alum about one ounce to the pint, it is placed in a solution of ozone bleach of the strength of about one to six of water. Holmes' ozone bleach is a substance which is used by laundresses for bleaching purposes, and can be obtained either at the oil shops or at several of the photographic chemists, and is very cheap. In the place of ozone bleach, a saturated solution of chloride of lime can be used in the same manner, but a substance which I like better than either of these is the hydrochlorite of potash, otherwise known as "eau de Javelle." To prepare this, dissolve one ounce of chloride of lime in fifteen ounces of water, and two ounces of carbonate of potash in five ounces of water. These are mixed, boiled, and filtered, and when cold are diluted, one of the solution to five of water being the strength I most generally use. All these methods act very much in the same manner, viz., by dissolving the upper part of the film away.

If reduction is to be carried to a great extent, the plate is placed in hypo, which dissolves out the silver that has been converted to the chloride. To reduce locally, a stronger solution is poured on the parts to be thinned the most, and, if necessary, these parts can be rubbed with the finger, or better still, with a piece of cotton-wool, until the required reduction is produced. Great care must be exercised in using these solutions. Do not handle the plate more than can be helped, or frilling may result; keep the plate gently rocking, or the reduction will not be even; do not rock too violently, or the edges of the film will be eaten away; do not have the solution too strong, or blisters will occur; and finally, let the tap be gently running so that the solution can be thrown off, and the plate be immediately washed without draining, or streaks and honeycomb markings will show themselves all over the plate.

Local reduction can be very well brought about by rubbing the parts to be reduced with a piece of wool dipped in strong alcohol, and, if carefully done, the result is very good. I have also heard of an operator who used to reduce locally with a mixture of very fine emery powder and some greasy material such as lard applied to the parts with a leather stump, but only very small places can be properly reduced by this means for obvious reasons. The grease is removed by a piece of rag dipped in turpentine.

The chemical method of reducing is done either with ferric chloride or potassium ferridcyanide. For the first of these make a solution of ferric chloride, one drachm to six ounces of water. The plate, on being immersed in this, has some of its silver converted to silver chloride, which is dissolved out with hypo. The method with potassium ferridcyanide, which was, I believe, introduced by the Polytechnic School of Photography, and which I prefer to all others, is as follows. A solution of red prussiate of potash (potassium ferridcyanide) is prepared. Some hyposulphite fixing solution is taken, and the prussiate added to it until it assumes a bright yellow colour. The plate is simply taken from the fixing bath and transferred direct to this, where it is kept gently rocking until reduction is complete. The beauty of this reducer is, no washing is required after fixing, and, also, you can be certain to what extent reduction will go. If the plate is to be reduced locally, it should be dried first if the parts have a sharp outline. The solution can then be applied with a camel's-hair brush, or, as before stated, the negative can be varnished all over except in those parts to be reduced, and the plate immersed in the solutions until thinned down enough. The chemical change which takes place with this reducer is: the silver, directly it is touched by the potassium ferridcyanide, is dissolved out by the hypo. One word more. As the ferridcyanide solution will not keep when mixed with the hypo, it must be made up a little while before using; and further, if reduction is to be carried to a great extent, the solution should be rendered highly alkaline with ammonia to prevent the negative turning yellow. So much, then, for reducing.

I will now proceed to treat upon the process of intensifying. There are three methods, so to speak, of strengthening the negative image, viz.: (1) the physical method, depending upon the crystalline attraction of silver in solution to deposit upon the silver forming the image; (2) the chemical method, depending upon the reducing power of silver to reduce a metallic salt which is soluble to a sub-salt, which sub-salt is insoluble, and is thus deposited upon the image, or else, by acting again upon another substance, produces an extra deposit; (3) by strengthening the image by adding a dark material to the back of the negative over those portions which require strengthening.

Under the first method comes Captain Abney's formula for silver intensification; it is as follows:—

*Solution* 1.

| | |
|---|---|
| Pyrogallic acid ... ... ... ... | 2 grains |
| Citric acid... ... ... ... | 2 to 4 ,, |
| Water ... ... ... ... ... | 1 ounce |

*Solution* 2.

| | |
|---|---|
| Iron sulphate ... ... ... ... | 5 grains |
| Citric acid... ... ... ... ... | 10 ,, |
| Water ... ... ... ... ... | 1 ounce |

Either of these solutions is taken, and a few drops of a 10-grain (to the ounce of water) solution of nitrate of silver is added just before using. It is then flowed over the plate. When the plate is sufficiently intensified it is washed, and placed in a solution of common sodium chloride, and, after again fixing for a few minutes in hypo, it is thoroughly washed. Any stains which may happen to appear may be removed with a 5-grain solution of potassium cyanide. Although this is theoretically the best form of intensifier, it cannot be recommended, owing to its liability to produce stains, especially if there should be traces of hypo in the film.

Another method of intensification, which is known as the Polytechnic method, and which, I believe, was introduced by Mr. C. Howard Farmer, is one of the best of its class that was ever invented. The intensified negative cannot be recognised from one which had been properly

* Continued from page 715.

strengthened in development, and its best recommendation is it does not require any washing to free it from the hypo. The following solutions are required :—

| | | |
|---|---|---|
| No. 1.—Silver nitrate ... | ... | 1 ounce |
| Distilled water... | ... | 12 ounces |
| No. 2.—Potassium bromide ... | ... | 4 ounces |
| Water ... | ... | 2 ,, |
| No. 3.—Hypo ... | ... | 2 ounces |
| Water ... | ... | 6 ,, |

No. 1 is added to No. 2; this, of course produces a precipitate of silver bromide, which must be washed two or three times in clear water and the water drained off. It is then dissolved by agitating it in No. 3. A muddy solution is thus produced, which must be filtered. The solution is made up to 16 ounces, and can then be bottled for use. To intensify a plate with this solution, it is first rinsed under the tap for a minute or so after removing from the fixing bath, and is then placed in the following :—Pyro preserved in sulphite, 4 grains; water, 2 ounces; silver solution (as above), 1 drachm, to which has been added about half a drachm of ammonia diluted to about 1 of ammonia to 8 of water. When density has been obtained, it is again riused and placed in the fixing bath to clear it; it is then finally washed. Should the silver not show any tendency to reduce—that is, should the plate not intensify as quickly as it ought—the solution requires more ammonia; but if, on the other hand, a brown precipitate is rapidly thrown down, it shows the presence of too much ammonia. If considerable density is required, it is necessary to throw off the solution as soon as it becomes muddy, and, after rinsing, to apply fresh. It is hardly necessary to add that the plate must be rocked all the time intensification is proceeding, otherwise it will become patchy.

Another way to use this intensifier is to place the plate in the silver solution for about five or six minutes, and, after letting it drain, to flood it with an ordinary oxalate developer, when the silver will be reduced. If only a slight increase of density is wanted, then the silver solution is diluted more or less—according to the amount of density required—with ordinary water. Of this intensifier I can speak in the highest terms, as being one which can be depended upon, and although appearing, from a mere verbal description, somewhat complicated, as being an extremely easy one to work in actual practice.

*(To be continued.)*

To Enamel Prints on Albumen or Gelatino-Bromide Paper.—A very cleau plate, larger than the print to be enamelled, receives the following mixture by means of a tuft of cotton :—Turpentine, 500 c.c.; rosin, 0·02 gramme; beeswax, 0·005 mm. The plate coated with this composition may be used for several operations. Dampened priuts are applied to the plate (care being taken to avoid the interposition of air-bubbles), aud when dry they may be easily detached. Iu the rather improbable case of a failure, the operation is begun again with the same print.—*L'Amateur Photographe.*

A Mean Trick.—Hostetter M'Ginnis has been paying his addresses, for some time past, to Miss Esmeralda Longcoffin. She had not given him the slightest encouragement, and he was about to commit suicide, when she threw him into a spasm of delight by asking him if he would do her the favour of giving her his photograph. He happened to have one with him, aud he begged her to accept it, saying that it was the happiest moment of his life, &c. As soon as he was gone the young lady called her servant, and, giving her the photograph, said : "Whenever anybody who looks like that comes to the door, tell him I am not at home."—*Texas Siftings.*

## NEW PROCESS FOR TONING BLUE PRINTS.

BY W. P. JENNEY, E.M., PH.D.

The intense blue colour of the ordinary blue print gives unnatural effects in prints from photographic negatives; also in architectural drawings where views and elevations of buildings are reproduced. The following method of toning such blue prints has been found to be easy of application, and to give tones varying from a brilliant blue through violet-blue to neutral tint and warm shades of grey, according to the intensity of the action of the bath.

The paper employed may be common blue print paper, sold ready for use iu rolls, or the specially made paper sold in packages of cut sheets by the dealers in photographic supplies. The solar printing is carried out in the usual manner. The best results are obtained with dark prints, as the intensity of the colour is somewhat reduced by the toning process. The following baths are employed :—

*Bath A.*

| | |
|---|---|
| Muriatic (hydrochloric) acid ... | 3 to 4 drops |
| Water ... | 16 ozs. |

*Bath B.*

| | |
|---|---|
| Aqua ammonia ... | 5 to 10 drops |
| Water ... | 16 ozs. |

*Bath C.*

| | Apoth. Weight. |
|---|---|
| Alum ... | 2 ozs. |
| Tannic acid... | 1 drachm |
| Water ... | 16 ozs. |

The prints are immersed face downwards in bath A until all the soluble salts contained in the paper are dissolved and removed, then dipped into bath B until the negative turns a violet-blue and the whites are clear, care being taken that the immersiou in the ammonia be not continued too long, as the definition of the picture may be injured. The priuts are transferred from the ammonia bath, placed face upwards in a tray filled with bath C, and exposed to bright sunshine for five to ten minutes, until no increase iu the strength of the picture can be noticed. The pictures are finished by toning in bath B until the desired shade of the colour is obtained, the picture becoming first a brilliant blue, then violet, and finally, by prolonged action, bluish-grey or neutral tint. The toning may be varied by a second immersion in the tannic acid bath, C, followed by a second toning in bath B. After toning, the prints are dried in the sunlight in the usual manner.

The above process is specially applicable to prints from photographic negatives, enabling the amateur in the field, provided with a printing frame, some sheets of prepared blue print paper, and the above easily procured chemicals, to test the printing quality of his negatives, with results only inferior in detail and definition to those obtained by the complicated process of silver printing.—*Scientific American.*

Croydon Microscopical and Natural History Club (Photographic Section).—On October 16th the first lantern night of the season was held, when a good selection of over 200 slides, the work of members, was passed through the lantern. There was a crowded attendance, and much appreciation was shown by those present.

Enfield Camera Club.—The first meeting of the winter session was held on the 14th iust., when the new biunial lantern recently purchased for the Club was used for the first time, aud several huudred slides brought by the members were passed through. At the next meeting, on the 28th inst., Mr. W. H. Trewartha James will read a paper on "Hand-Cameras."

## Notes.

The editor of the *Photo-Gazette* has written to us commenting upon what we said in a recent leading article with reference to a certain photograph which purported to have been taken with the telescopic objective of M. Jaret. We pointed out that the picture in question bore distinct evidence that it had been taken close to the object, and not from a distant point. The Editor of the *Photo-Gazette* courteously admits that we are right. He tells us that the picture was published in his absence, and that directly he found out the mistake he issued a circular to his correspondents explaining the matter, and promising a picture really taken with the new apparatus at an early date. This circular we never received, or, of course, we should not have called attention to the circumstance, which he naturally deplores.

In Mr. Jerrold's biography of Gustave Doré, there is an amusing account of the manner in which the artist dispersed a crowd of onlookers who had gathered round the camera when his friend Dalloz was trying to take a photograph in the streets of Verona. After Doré had gesticulated and threatened the idlers until he was tired he bethought him of another plan, which he proceeded without delay to put into practice. He took off his coat, threw it on the ground, and, assuming an expression of the deepest woe, held his cap to the crowd for charity. The people thereupon seemed to remember that they had an important appointment elsewhere, and hurried off as quickly as could be wished. The photographer was then left to do his work in peace.

This anecdote is worth remembering as suggesting a way of escape from an annoyance which is by no means confined to the city of Verona. Londoners are happily so used to the sight of a camera-bearer that they do not care to pause on their way as he exposes a plate. Most of them know "how it's done." But in country districts it is different, and a small crowd quickly collects to watch the operations, and make personal remarks. If they remain silent they will generally endeavour to be in the picture at all hazards; but what possible pleasure there can be in figuring in a photograph which they will never see is a mystery which has always remained unexplained.

"Can Photography Lie?" was the question asked in large letters on the contents sheet of *Tit-Bits* last week. Being jealous of the reputation of our beloved art, we purchased a copy of the paper in order to see whether it was charged with mendacity, or held to be guiltless of that sin. We cannot say that there was much to learn from the article to which this question formed the title. It told how exaggeration was begotten by the abuse of short-focus lenses, and for this reason the reader was cautioned to take house agents' photographic productions *cum grano*. But the writer was decidedly out of his depth when he described composite photography as being "accomplished by cutting out different parts of several photographs, arranging them together, and re-photographing them."

Amateurs who are ambitious in the direction of taking photographs from a balloon may like to know that a balloon is not absolutely indispensable for such photographs. Some time ago a photographic kite was devised by M. Arthur Batut, but the invention had defects which prevented it coming into use. M. Wenz, of Rheims, has now brought out an improvement of M. Batut's idea, and with it has obtained very good results. The shape of the kite is that of a quadrilateral of two isosceles triangles base to base, the larger undermost; and the camera—made of wood and cardboard, with aluminium mountings, for the sake of lightness—is fastened to the back of the kite. The exposure is made by a cord attached to the camera. Whether the result is worth the trouble involved is open to question.

Photography, according to a French lady who has written a book recording her impressions of Ireland, is rapidly spoiling that picturesque show-place, the Giants' Causeway. The lady bitterly complains of the vulgar herd of tourist visitors, not because they are vulgar, but because they will stand and be photographed there, and, in some cases, leave mementoes of themselves behind in the shape of photographs which are exhibited in the windows. We must confess to a lurking sympathy with this lady. Not only the Giants' Causeway, but many other romantic spots, are rapidly being vulgarised by photographs which, otherwise admirable, are spoilt by the introduction of inappropriate and too often ungainly figures. Why, when we buy a photograph of some lovely bit of scenery, should we also be compelled to purchase the portraits of the Smiths and the Jones's who are "doing" the district? If a figure be necessary, let it be the figure of a native, whose garments would at least be in harmony with the surroundings.

One of the many curious revelations of photography is that which first made known to the relatives of Emerson the approach of the mental disorder which marked the essayist's later days. When the decay of his mental faculties was not suspected, he went with some of his relatives to be photographed. There was nothing noticeable in his manner, but when he directed his gaze steadily at the object selected by the operator, the features relaxed very peculiarly, and the expression of the eyes and mouth, says the narrator of this curious experience, was strongly irrational, if the word can be used in such a connection. The relatives who were accustomed to his features and their expression saw in the negatives what they could not see in the original, and they determined to have no prints made from them; so the visit was paid for, but the negatives destroyed. It was noticed that, as Emerson left the studio, his eyes were bent steadily on the floor, and he smiled continually. In a very short time it was known that his mind had given way.

It almost seems as if the maxim of a daily paper was: When hard up for a novelty, try photography. Photographing a bullet in its flight through the air must now take a humble seat. The place of honour has been assigned to an apparatus invented in Vienna "for taking photographs in a rifle, the apparatus closing of itself every time a shot is fired." The photograph, we are further informed, "will show the object aimed at in a circular picture, in the centre of which the shot must have fallen." If this be really true, the apparatus is more wonderful than ever the inventor imagines. When a gun is pointed at a distant object, allowance must be made for windage and for the trajectory curve; while, therefore, the bullet may hit the target, the rifle may be pointed at quite a different object. If, under these circumstances, a photograph is taken of a target, this diminutive camera must possess the unique quality of looking round the corner.

## THE PALL MALL EXHIBITION.

Two very dainty portraits are those numbered 235 and 236, from the camera of Mr. P. J. Lankester, but the shadows of the first-named are somewhat heavier than could be wished. The last-named is a particularly effective picture, soft in texture, well lighted, and elegant in pose. Moreover, the draperies are singularly well arranged. Mr. Karl Greger is responsible for the three pictures Nos. 242-244, and he need be under no apprehension that they will meet with anything but praise. They speak well for the excellence of Obernetter paper when toned with platinum, the colour being very agreeable to the eye and suited to the subjects. No. 244 is entitled "The Last of the Flock," and, although the composition is of the most simple character—a few sheep in a field, backed by some trees and a hedge, and crowned with a cloudy sky—the result is in every sense a picture. Not one camera-bearer in a hundred would have thought of making such a combination into a picture, but Mr. Karl Greger has made the attempt, and has succeeded well. Mr. Martin J. Harding is an amateur who is rapidly coming to the front rank, and his two pictures, "In Winter's Grasp" and "Near Barmouth," are quite up to the standard which he has taught us to expect. Indeed, he shows himself as thorough an expert with the camera as his great namesake did with the pencil and lithographic crayon. No. 237, a large carbon picture of the interior of a sumptuous *boudoir*, suffers from unsatisfactory lighting, and is therefore wanting in effect. Nos. 240 and 241 are genuine little touches of nature, but they are so much alike in character that one is apt to rob the other, and the artist—Mr. W. P. Marsh—would have done well to have exhibited one of them alone. Each represents a tiny chicken which has just emerged from its shell, and looks with wonderment upon the world into which it has been launched. A number of views of Egyptian temples bear testimony to the excellence of Mr. Conybeare's work. Such pictures printed in platinum, as these appear to be, are of great value if all be true which we hear about the neglect and slow destruction of the original monuments.

And now we come to a frame which bears the word "medal," and never, perhaps, was a prize better earned than by these four beautiful snow scenes by Mrs. E. Main. The four pictures bear the title "A Frosty Morning—St. Moritz," and each is of a different subject. The texture of the foreground snow is remarkable, and shows that peculiar characteristic which is best described by the word "fluffyness." Nothing but a gelatine plate could give those silvery grey shadows which are peculiar to snow, and upon which snow pictures depend for so much of their beauty. There is a brilliance about these sunlit scenes which makes them very different to the majority of those taken in our own dull winters here at home. Mr. H. W. Bennett shows some breezy seascapes, which he calls "Studies of an East Coast Fishing Fleet." He contrasts them with two rustic scenes, "An Essex Village," and "A Surrey Stream." Many will identify this latter picture with a certain mill-stream at the foot of Box Hill. Mr. Bennett has certainly made the best of it by so placing his camera that he can utilise some rushes in front and some foliage at the side. The swans and their young ones help, too, in breaking up the surface of the water. Mr. Chang does not show us his best work in 268 ("Sunbury Lock"), which is commonplace, but by way of compensation he has allowed himself to become the subject of a photographic joke in No. 279 ("Mr. Chang's Afternoon Walk"), by Mr. F. Brocas. Here we see Mr. Chang looking happy and genial as usual, and escorting no fewer than five ladies—two on one arm and three on the other. "How happy could I be!" he seems to be saying to himself.

We think very highly of a picture which is given such a lowly position that it is apt to be passed over unnoticed. This is No. 286 ("Solitude"), by Mr. T. Orton—a swollen stream with a few trees bending over it, and with a soft grey light pervading the whole. Mr. B G. Wilkinson always exhibits good work, and here we have a capital picture called "The Bookworm" (No. 274). A monk is absorbed in an old volume which he holds in his hand, while he paces the grass in front of an old wall. This peep into the monasticism of the past is well relieved by Mr. Stephens' pleasant skating scenes, wherein the young people seem to be all on the go, and are looking as bonny, merry, and warm as healthy youngsters should look on a winter's day. But this exhibitor has by no means lost his cunning in the matter of flowers, for there hangs here No. 291, a study which recalls his old favourite works. This is an alabaster vase filled with roses and fuchsias, with a bush of delicate maidenhair breaking its formal lines. Mr. W. J. Byrne's "An Eastern Beauty" is a very attractive portrait treated with originality. Mr. F. Hollyer exhibits several pictures, which are excellent copies of paintings. They are all labelled "not for competition." One very fine one is "Dante's Dream" (from the painting by Rossetti), and another, which at once arrests attention because of its merit and beauty, is the "Head of a Girl," from the delicate brush of Greuze.

Mr. J. Chamberlain shows four pictures which must have cost him a great deal of trouble, in the employment of about two dozen models. They bear the titles, "In a Café in Cairo"; "Hiring a Donkey for the Pyramids"; "In a Bazaar, Cairo"; and "A School." They are not, however, what may be described as successes. They are artificial in character, and all the figures are on their best behaviour, with the self-conscious look of anyone knowing that his portrait is being taken. In No. 292, we have one of Messrs. West and Son's capital yachting subjects, "Racing in the Solent," the locality being well marked by the presence of one of those island forts which are so familiar to tourists to the Isle of Wight. Mr. Kenrick B. Murray's "Views in the Vosges, France" (Nos. 295-299) are excellent examples of well-chosen subjects for the camera. The last-named, a river beneath overhanging trees, is especially beautiful. The colour of the mounts of these pictures, by the way—a dark oak—is not calculated to add to the good effect of the photographs. Mr. A. R. Dresser shows seven pictures enlarged on bromide paper from quarter-plate hand-camera negatives. They are on the rough description of paper, and are of a very warm tone. Viewed from a distance of a few yards they are very effective, and look like sepia drawings. Like many other pictures in the Exhibition, they are necessarily injured in effect by their close proximity to one another.

Nos. 313 and 314 are pinhole pictures—landscapes, with reeds and rushes—by Mr. A. Maskell, and are marked "not for competition." "The Taker Taken" is the title of No. 317, by one of the older school of amateurs, the Rev. H. B. Hare. This gentleman always shows good work, and has many medals in proof thereof. It is a pity that Mr. Tyser's picture (No. 315), "On the

Grand Canal, Venice," is hung so high, for it is such a pleasing one that it invites closer acquaintance. In the somewhat misty distance is the cathedral of St. Mark, and moving in front are the black forms of various gondolas. We pause to regard with interest a little picture by E. S. Padmore (No. 328), "Hartz Cobolds." This title will not seem very explanatory to many visitors to the Exhibition; but for all that it is a good one, for the picture represents some men at their work in the Clausthal mine at a depth of 696 metres below the surface of the ground. Were not the original "Cobolds" the imps which used to haunt these mines? And have they not christened a certain mineral found there—to wit, cobalt? But, apart from its intrinsic merit, which is great, the man who descends into the bowels of the earth to a depth which would be represented by five and a-half times the height of St. Paul's Cathedral, for the purpose of taking a photograph, certainly deserves honourable mention.

We must close our present review by noticing Mr. Ralph Robinson's pictures, which remind us of those of his talented father. One of these has been most rightly awarded a medal, and we have no doubt that, in making that award, the judges took note of the general excellence of Mr. Robinson's exhibit. Three of these are portrait studies printed in red, and very fine they are in quality, helped as they are by good models. All Mr. Robinson's pictures have rough wooden frames with subdued gold and silver enrichments, and, while these are very effective for the portraits, they do not seem to harmonise so well with the landscapes.

## EXHIBITION AT HACKNEY.

The exhibition of the Hackney Photographic Society opened under auspicious conditions on Wednesday last at the Morley Hall, Triangle, N.E. Under the active and efficient management of the hon. sec., Mr. Fenton Jones, the exhibition, which, unfortunately, only remained open for two days, proved, during its short tenure, a decided success so far as the pictures and apparatus were concerned. With regard to the financial success of the venture we have, of course, at present, no data to go upon, but the hall appeared to our representative, who was there on Wednesday, to be well patronised.

The list of awards has not yet come to hand, for they were not decided upon until yesterday, Thursday morning, when Capt. Abney presented the prizes to the winners. The pictures were prettily arranged in alcoves, and well lighted by lines of gas burners above, such as are employed at the Crystal Palace for the same work. Many of the pictures shown were of high merit, but the exhibition unfortunately came too close to our time for going to press to attempt any analysis of them.

The apparatus section did not produce anything very new, but what there was was of the best. Messrs. Adams, Messrs. Watson, and the Platinotype Company—who demonstrated their method by the hot process—were among the exhibitors. We must not omit to mention, too, that Mr. B. J. Edwards—who, by the way, is a native of Hackney—was represented by a fine show of isochromatic pictures and transparencies.

Photographic Club.—October 28th, smoking concert and exhibition of members' pictures; November 4th, annual general meeting.

## NITRATE OF URANIUM TONING PAPER.

BY M. MERCIER.

It is known that some sensitive papers, variously prepared, have the property of acquiring an agreeable tone after a simple fixing, and without having been previously toned. I think I have now determined the special conditions under which this peculiarity is produced. Having the intention, later on, to treat this subject at more length, I will give simply the conclusions of my investigations, conclusions which may be summed up as follows. When we introduce into a sensitive paper, at the same time as the chloride of silver forming its base, a suitable reducing body, capable of reducing the silver salts under the action of light and giving a certain tone, this tone is more or less communicated to the silver reduced by the action of light on the chloride of silver alone. It is thus that sizes made of arrowroot, or more or less condensed starches, albumen, resins, gelatine, &c., yield papers which, after a simple fixing, give different tones. It is thus, again, that the oxalates, the benzoates, the citrates, &c., give, with chloride of silver, prints which have, after fixing, variable tones—purples, browns, or cherry-red. It is thus possible, instead of adding to the paper the already formed reducer, to cause this last to be produced by the action of the light itself. This happens, for example, when we add to the paper a per-salt of uranium, easily reduced under the luminous action to the condition of a proto-salt. Nitrate of uranium, which possesses, besides, precious preserving properties, was therefore already indicated for the preparation of a paper requiring no toning, such as the one I have had prepared under the name of *iso-toning paper.*

The print shows itself as usual, rapidly and with great sharpness. It is fixed directly, and without previous washings, either with pure hyposulphite of soda or, preferably, in the fixing bath of hypo and sulphite of soda. The print is washed and dried; it then acquires a violet-sepia tone, and in a few days gradually becomes darker and very pleasant to the eye. The toning may be instantly obtained by burnishing with the aid of heat, or by exposing the print to heat by any means whatever. An ordinary sad-iron yields excellent results. The print then acquires a beautiful violet-black tone, very greatly resembling the best tones obtained by toning with the gold salts. I will add, moreover, that some sensitive papers acquire by this treatment a more or less dark tone, but then this tone is rarely persistent. The iso-toning paper may also be toned with the greatest facility in the weakest gold or platinum baths; nitrate of uranium modifying the action of the bath, it is possible to obtain all shades from purple up to a blue-black. Toning after fixing yields equally excellent results. Yellow negatives, such as those developed with pyrogallic acid, yield, generally, prints having a very beautiful violet-black tone, even without the intervention of heat.—*Bulletin de la Société Francaise de Photographie.*

The Lantern Society.—Meeting on October 26th at 8 p.m. New oil lamp by Mr. Stocks.

Rudolph Cronau, the eminent author and scientist of Leipsic, Germany, has tendered to the Exposition his extensive collection of paintings, sketches, and photographs, representing scenes in the life of Columbus, and places visited by Columbus during his voyages to the new world. Doctor Cronau has spent a great part of his life in the study of early American history, and has published a work on the subject based entirely upon his personal investigations.—*World's Fair Notes.*

## ART *VERSUS* PHOTOGRAPHY IN NEW ZEALAND.

It is amusing to find that the everlasting discussion as to the relative merits of paintings and photographs has reached the Antipodes. A correspondent at Auckland, New Zealand, has kindly sent us cuttings from the *New Zealand Herald*, which show that this is the case; and we need hardly say that the end of such a controversy is the same as it is here—no one is brought over to the view of his opponent, and the matter remains just as it did before so much ink had been shed upon it.

It seems that the discussion arose in this way. During certain proceedings of the City Council meeting, the Mayor, in presenting an enlarged photograph of Mr. J. T. Mackelvie to the Art Gallery, said that when the City Council received the Mackelvie collection for the benefit of the city, it was stated in the catalogue that there was a portrait of Mr. Mackelvie. This they understood to mean an oil painting, but this was the only picture missing, and there was no portrait of Mr. Mackelvie to hang in the Art Gallery. He ascertained, however, that Mr. D. L. Murdoch had a photograph of Mr. Mackelvie which was taken in Rome—a cabinet photograph—which Mr. Murdoch had given for the Art Gallery. He (the Mayor) thought that something more striking was required, something which would catch the eye and give an idea of the man who had so liberally endowed art in Auckland, and he had the photograph enlarged by Mr. Hanna. Dr. Campbell and Mr. Murdoch, and others who were intimately acquainted with Mr. Mackelvie, considered it a splendid likeness. He had great pleasure in now presenting it for the acceptance of the Council. The picture was accepted with gratitude, and the Mayor was thanked for his thoughtful gift.

So far, so good. But it seems that the photograph, good as it was, did not give universal satisfaction, for "A Citizen" writes to the *Herald* in the hope that the Mayor may see it desirable to place something before the public more worthy of the generous donor than a mere white and black representation of Mr. Mackelvie seen in the enlarged photograph referred to. If Mr. Mackelvie is worthy of lasting memory, the city should endeavour to procure a good oil painting by some good portrait painter. The public, he asserts, may be for the most part satisfied with the results of photography, but the art student will remember that it is a mechanical effort with results never more than comparative in degree; its chief defect the absence of colour, and for this reason the larger the photograph, the more defective it appears. The efforts of purely human genius presented in painting and sculpture are far removed from the photographer, and the Art Gallery provides this lesson for the intellectual citizen to emulate.

"A Citizen" appears to be a little mixed in his ideas, but he is backed up by another correspondent, who remarks that "Photography is to art as chalk is to cheese—both are useful forms, but rank under different values. Photography, like chalk, is useful for educational purposes, but the actual results achieved by the brush are immeasurably higher than the lens can ever reach, and form the best and most solid nutriment for the artistic faculty. You must excuse the repetition of these platitudes, as they do not appear to be generally understood and accepted in our matter-of-fact community. As to the expense of such a compliment to the donor of so many art treasures, *that* should not be allowed to stand in the way. Putting the matter solely on the ordinary commercial basis of debtor and creditor, we can afford to spend a large sum on this object, and then remain Mr. Mackelvie's debtors. But it seems to be the fate of all free gifts that they are lightly esteemed."

Then Mr. Hanna takes up the cudgels, and points out very rightly that if a portrait of the late Mr. Mackelvie is to be painted, the artist will, after all, be obliged to use the photograph as the basis of his work. Again "A Citizen" takes up his pen, and becomes somewhat discursive in his remarks, as the following extracts will show:—

"I did not wish to underrate the art of the photographer, as many other readers of your journal will have derived, with myself, much pleasure from the productions of Mr. Hanna. I do, however, lament its defects when I think of the poor result of any picture of an Auckland sunset, with its gorgeous tints, or the vivid and extraordinary beauty of colour presented in our geysers and other scenery of the lake district, recorded by the dull photo-pictures as faithful effects, and as such presented to tourists and others who visit Auckland. I have stated that the results are merely comparative by photography, and, in view of the lasting memory desired by the citizens of the once generous Mackelvie, I desire to call in the superlative effort of the portrait artist, who, with a trustworthy description of complexion, colour of eyes and hair, and other lesser details, can—and doubtless will—produce a picture that may surprise those unacquainted with these matters. Indeed, many pictures are painted in this way, and photographic enlargements are coloured by intelligent artists from day to day in the studios of the larger cities of the world.

"With regard to the use of the camera by artists, I may say that it is largely treated by gifted men as a philosophical toy, and the defects of ignoring the blues and bringing out the vivid yellows as black renders it somewhat dangerous to the student of colour. In the matter of copying the old masters, I might state that it is generally conceded by the art critics of the day that the modern schools of painting are quite equal in effects, and, by the materials employed, excel in many cases the most celebrated productions of the old masters."

We may remind our readers that many specimens of the excellent photographic work done by Mr. Hanna have been exhibited in London, and that we may, therefore, feel sure that the much-discussed portrait was as good a one as possible.

---

Sheffield Photographic Society.—A special meeting was held at the Masonic Hall on Friday evening, when Mr. H. M. Smith described the kodak camera, and gave a demonstration and exhibition of lantern slides made from kodak negatives.

Rapid Toning.—Acetate of soda, 18 parts; bicarbonate of soda, 9 parts; borax, 33 parts; water, 3,840 parts. At the time of using, or rather two hours before toning, put 1 gramme of chloride of gold in 2,500 c.c. of the above solution, which keeps well in stock.—*L'Amateur Photographe.*

International Photographic Exhibition at Leeds.—The entries for this exhibition, to be held from December 7th, 1891, to January 9th, 1892, will close on November 12th. Applications for prospectus should be made to Mr. G. Birkett, Municipal Art Gallery, Leeds.

To Remove Yellow Tone of Gelatino-Bromide Prints.—Plunge the prints in a solution composed of saturated solution of oxalate of potash 2 parts, water acidulated with acetic acid 1 part. The immersion may last an hour or two. This method is also efficacious for prints that have been made several months.—*L'Amateur Photographe.*

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Pyro in the Eikonogen Developer—Rapid Hydroquinone Developer — New Photo-Lithographic Process — Washing Apparatus for Gelatine Plates — A Substitute for Lantern Slides on Glass—Pyro Developer with Caustic Alkali.

*Pyrogallic Acid in the Eikonogen Developer.* —If highly-sensitive gelatine plates are used, it is often difficult to obtain with them in developing that amount of density which is required in order to produce a vigorous print on albumen paper. With the ordinary ferrous oxalate or eikonogen developer, intensity is obtained in the case of a highly sensitive plate within six or eight minutes, it being, however, only an apparent intensity, which allows the light to pass through, and to produce greyish and undefined prints. A concentrated pyrogallic acid solution gives more satisfactory results, but in this case it is necessary to prolong exposure to some extent. A developer which, in the case in question, answers perfectly is the following, which was recommended some time ago in the *Deutsche Photographische Zeitung.* Even in the case of very short exposures, it gives very intense negatives of a beautifully brownish colour. It develops the image within from three to four minutes, leaving the shadows absolutely clear, and giving details even in the deepest shadows. The following solutions should be prepared:—

*Solution* No. 1.

| | |
|---|---|
| Water ... ... ... ... | 1,500 c.c. |
| Sodium sulphite ... ... ... | 160 grammes |
| Eikonogen ... ... ... ... | 20 ,, |
| Citric acid ... ... ... ... | 20 ,, |

*Solution* No. 2.

| | |
|---|---|
| Water ... ... ... ... | 1,000 c.c. |
| Potassium carbonate ... ... | 160 grammes |
| Sodium carbonate ... ... ... | 320 ,, |

For use should be mixed:—

| | |
|---|---|
| Solution No. 1 ... ... ... | 75 c.c. |
| Solution No. 2 ... ... ... | 25 ,, |
| Alcoholic pyro solution (1 : 10) ... | 5 to 6 ,, |

The temperature of the developing solution should be always kept between 68° and 72° F.

*Rapid Hydroquinone Developer.*—The so-called rapid hydroquinone developer, as recommended by Prof. Lainer, has been slightly modified by M. Pellechet, according to the *Archiv,* in the following manner:—

| | |
|---|---|
| Hot water ... ... ... ... | 1,000 c.c. |
| Sodium sulphite ... ... ... | 200 grammes |

To this is added:—

| | |
|---|---|
| Hydroquinone ... ... ... | 40 ,, |

For use, from 20 to 25 c.c. of this solution are diluted with from 100 to 125 c.c. of water (which should be warm in winter), and to this the solution of the alkali and ferrocyanide of potassium should be gradually added. The concentrated solution is said to keep perfectly clear for months. The used developing solution may be preserved and employed again in the case of reproductions.

*New Photo-Lithographic Process.*—In the same journal a new photo-lithographic process is described by C. Fleck. In this process a photo-lithographic transfer paper is used that can be purchased ready-prepared; the well-known Husnik paper answers perfectly. It is sensitised in a solution of bichromate, and then printed exactly as described in the instructions given with the paper by the manufacturers. After printing, the print is placed in the dark room in a solution of chloroform until it becomes sufficiently saturated with it, when it should be placed upon a clean glass plate and coated with a sensitive asphaltum solution. When dry, the print is placed for about ten minutes in hot water, and is then developed on the glass plate by circular rubbing with a pad of cotton, which should be continued until every line of the image appears clear and distinct. The print is then rinsed with cold water, soaked for about five minutes in a solution of chrome alum (1 part in 100 parts of water), and again washed. Finally, the print is gummed. In this state it may be kept for months before it is used to make a transfer. Before use the print should be freed from the gum layer by means of water, and the excess of water removed by gently dabbing the print with a sponge. Whilst the print is soaked in the water bath, a small quantity of the following photo-lithographic ink should be spread, by means of a glue roller, over an inking slab:—

| | |
|---|---|
| Transfer ink ... ... ... ... | 100 parts |
| Syrian asphalt ... ... ... ... | 50 ,, |
| Venet. turpentine ... ... ... | 50 ,, |
| Boiled in | |
| French turpentine oil ... ... ... | 200 ,, |

Finally, after the ink has been removed from the fire, 100 parts of benzol should be added to it with constant stirring. With this ink, the print, whilst it is still wet, is rolled up until an even film of ink is left upon the paper, through which the image can be seen distinctly. When the print is inked up, a transfer is made from it in the usual manner. This method has the advantage that a single print is sufficient, which may be kept for months, and which also then produces any number of transfers of great brilliancy.

*Washing Apparatus for Gelatine Plates.*—Dr. E. Vogel describes the following simple, cheap, and practical washing arrangement for dry plates, which has been in use since 1883 at the Technical High School of Charlottenburg. Essentially it consists of a flat box of sheet-zinc. For plates 13 by 18 centimetres, it is about 19 centimetres wide, 60 centimetres long, and from 1·5 to 2 centimetres high. The plates are placed in it side by side. The box is placed slightly slanting, so that its upper end is still covered by the water whilst the latter runs down at the lower end of the box. For use in photographic establishments of moderate extension, a single basin is sufficient. It is placed obliquely with its upper side beneath a water-conduit. In case a large number of plates are to be washed, a number of these boxes may be superimposed on an iron stand, so that the water runs from the upper box into the lower ones, which are richest in hypo. The plates are at first placed deepest, and as soon as fresh ones are added, they are pushed higher and higher. This arrangement prevents the plates which are already partly washed out being soiled by freshly added ones. The consumption of water amounts to only one-eighth of that of the ordinary washing boxes.

*A Substitute for Lantern Slides on Glass.*—To a firm of Nuremberg, a process of making transparent pictures on paper for the magic lantern has been patented in this country. The process consists in the following. Thin paper—so-called letter-paper—is placed in a bath of creosote oil, or coated with this liquid, and exposed to the action of it, until the fibres of the paper are no more visible. The surplus creosote oil is then removed between two layers of blotting-paper, and the paper so treated is immersed in a solution of colophony in alcohol, or coated with it. It is then suspended to dry, and when perfectly dry coated with a diluted gelatine solution. After this gelatine coating has perfectly dried, the paper is provided with the picture by means of one of the common printing processes, and finally coated with a diluted solution of spirit varnish. It is said that these paper pictures give quite the same effect in the lantern as the glass slides. They have the advantage that they may be printed on very long strips of paper, and wound up on rollers, by which a uniform and continuous effect is ensured.

*Pyro Developer with Caustic Alkali.*—The following developer has given in my hands very good results in the case of short exposures:—

| | |
|---|---|
| Pyrogallic acid ... ... ... | 3 grammes |
| Sodium sulphite ... ... ... | 10 ,, |
| Chloride of ammonium ... ... | 4 ,, |
| Water ... ... ... ... ... | 500 ,, |

To this solution is added—

| | |
|---|---|
| Caustic soda ... ... ... ... | 3 grammes |

For use, to each 50 c.c. of this developer 1 c.c. of a solution of potassium bromide (1 : 10) should be added.

## FURTHER NOTES ON SILVER PRINTING.*

BY LYONEL CLARK.

My contribution of this evening to the proceedings of our Club will partake rather of the character of desultory notes than that of a fixed paper, as I propose to give you the benefit of what further experience I have gained in a year's working of the process I described before you on December 19th last, and also to more fully develop the process of intensifying my silver prints, which I merely foreshadowed on that evening.

Beginning with the support or paper that is to receive the print, I mentioned that I had just received a batch of paper from Messrs. Reeves and Sons, known as "Arnold's pure unbleached," but had not had time to experiment with it. Since that date I have, however, been able to give the paper a thorough trial, with the result that I certainly find it superior in quality—or, perhaps, I should say purity—to any of the Whatman papers. The rough quality shows a rather decided diagonal surface grain, to which personally I do not object, although others may; but the smoother qualities, of course, are quite free therefrom. It is, however, on account of its great purity that I chiefly prefer it, for I have hardly met with a single instance of metallic impurities, or, indeed, any imperfections in the paper. I am unaware whether there is any difference in the sizing of this and the Whatman paper, but I am inclined, from its behaviour, to believe that there is.

With the Whatman I have frequently—indeed, almost universally—found patches of the paper that refused to soak up moisture, and remained comparatively hard and dry, even through the toning, fixing, and washing baths. I cannot say that there was anything dangerous about the appearance, nor, indeed, was it at all visible on the face; but I always had a sort of feeling that these patches might be portions of coagulated sizing and silver, to which the hypo could not get proper access, and which, therefore, would remain as patches of hyposulphite of silver, or silver chloride, only waiting the proper temptation to burst out into nuclei of discolouration or areas of fading.

* A communication to the Camera Club.

I must confess that up to the present they have not been led into temptation, or the temptation has not been strong enough, for I have failed to trace any harm to their presence. But, nevertheless, the freedom that the Arnold paper appears to possess from them is, in my estimation, another plea for its adoption.

Coming now to the sizing and salting baths, I find but little to change in my formulas. The quantity of gelatine I have recommended is doubtless high, as indeed is also that of the salt, but the amounts are intentional, as it is essential to get as vigorous an image as possible if we wish to have a good black-and-white picture left after toning.

I have personally almost discarded the use of arrowroot or any other sizing agent than gelatine; or, if I do use it, I make it up fresh each time. I find that if the arrowroot mixture be allowed to stand, all the colloid principle appears to settle down to the bottom, and the clear liquid that is decanted off is little better than salt water. Used fresh arrowroot is, however, very useful, but it is difficult to get it to the right degree of viscosity; if too thick, it dries in streaks on the paper, especially when the solution is cooling, and unless one does use it as thick as possible it will not remain sufficiently on the surface of the paper. Therefore, for the rough papers, or those requiring a maximum of sizing, I have discarded arrowroot in favour of gelatine; but for the smoother quality of paper it can be advantageously used of a strength of about 18 grains to the ounce, or 1 in 25. This strength is practically about as thick as you can get it to lie on the paper evenly, and may, of course, vary with different samples. The solution should be used fresh each time, and the paper floated on it while it is still quite hot—in fact, it should be kept hot by the addition of hot water to an exterior dish, making, in fact, an impromptu sort of *bainmarie*. I find no filtering to be necessary. If the dish be covered to a depth of a half-inch, any impurities will sink to the bottom, or, if left floating, will come off if a trial piece of paper be used to skim the surface.

Gelatine should also be used as hot as possible, at least when coating rough paper, and the strength of 24 grains to the ounce, or 14 grammes to the litre, has given me the most satisfactory results. I am afraid I did not make it sufficiently clear, either in my pamphlet on "Platinum Toning" or in my paper before this Club, that it was necessary to apply the gelatine, when used in such strong solutions as I recommended, in as hot a state as possible. If the smoother variety of paper be used, such a proceeding is not so necessary, but with the rough papers it is essential that the gelatine should be very thin and liquid, so that the excess can freely run off the surface of the paper, and not lie in and clog up the interstices between the granulations. With the above strength of gelatine, it must be used quite warm to do this, and therefore I now make it a practice, if I have many sheets to salt, of keeping the bath warm by immersing it in another larger dish that I supply from time to time with hot water.

Unlike the arrowroot bath, the gelatine one can be used over and over again, the jelly that forms when the solution cools being each time redissolved by the application of heat. In fact, the bath remains good as long as the jelly remains a jelly when cold: when the mixture shows signs of becoming watery and losing its viscosity, the gelatine is beginning to perish and rot, and should be thrown away.

I have quite discarded filtration also with gelatine, and use instead a pretty deep layer of the liquid, when the heavy impurities will sink to the bottom, and the lighter ones will be taken up by the first piece of paper floated, which should, therefore, be a waster.

If anything, I am inclined to think that for summer work, or for hard negatives, the strength of the chloride given is too strong, and I now usually reduce it to 6 grains per ounce, or 1 in 73, but for feeble negatives the 8-grain bath can still be used.

As a general rule, too, I use the simple chloride bath, and keep the mixed citrate and chloride one when very vigorous prints to give very black images are required. For the benefit of those who were not present at my last lecture, I will here repeat these formulas of salting baths.

For average negatives from spring to autumn:—

| | | | |
|---|---|---|---|
| A.—Chloride of ammonium | ... 120 grains | ... 14 grams |
| Water ... ... | ... 1 pint | ... 1 litre |

For feeble negatives or for winter light:—

| | | |
|---|---|---|
| B.—Chloride of ammonium | ... 160 grains | ... 19 grams |
| Water ... ... | ... 1 pint | ... 1 litre |

To these baths a crystal of soda carbonate about the size of a pea should be added to insure their alkalinity.

To obtain very vigorous prints, or for weak negatives or very feeble light:—

| | | |
|---|---|---|
| C.—Chloride of ammonium | ... 120 grains | ... 14 grams |
| Carbonate soda crystals | ... 240 ,, | ... 28 ,, |
| Citric acid crystals | ... 60 ,, | ... 7 ,, |
| Water up to ... | ... 1 pint | ... 1 litre |

With all these baths the amount of gelatine to be used is:—

| | Grains. | Grams. | | Grains. | Grams. |
|---|---|---|---|---|---|
| Rough paper ... | 240 | 28 | | | |
| Not hot-pressed ... | 120 | 14, | or arrowroot, | 180 | 21 |
| Hot-pressed ... | 60 | 7 | ,, | 180 | 21 |

These quantities are per pint or litre of liquid.

Coming now to the application of the salting solution to the paper, I now invariably use the floating method as the most suitable and easy. It is true that most heavy, rough papers will be found to be very repellent of the liquid, and, when floated, will at first refuse to take up any of the solution. But I get over this difficulty by brushing some of the hot salting solution over the surface of the paper before floating it. For this purpose I lay the paper face upward on a board, and with an ordinary broad camel-hair brush apply a fair amount of the hot solution as evenly as possible to the surface of the paper, and then leave it lying on its back whilst the preceding sheet is floating on the bath. This procedure effects a double object; it not only makes the paper take kindly to the bath, but causes it also to imbibe a certain amount of moisture, and, therefore, to lie nice and flat on the bath. I usually float the sheets for three minutes, and while one is being floated a second is being brushed over and left ready for its turn.

With regard to the drying of the paper, I have nothing to add, except to reiterate the statement that they should not be dried in a cold place; in fact, the hotter the drying room, the better.

(*To be continued.*)

Torquay Photographic Association.—The second annual meeting was held on October 20th for the election of officers and committee, passing reports and accounts. The number of members is fifty-three, and meetings are held on the third Wednesday of the month. The Association has become affiliated to the Photographic Society of Great Britain.

## Patent Intelligence.

### Applications for Letters Patent.

17,408. William Tylar, 12, Cherry Street, Birmingham, "A New or Improved Holder or Stand for Displaying Multiple Photographs and the Like."—*October 13th.*

17,516. John Edward Thornton and Edgar Pickard, 6, Bank Street, Manchester, "Improvements in Shutters for Photographic Cameras."—*October 14th.*

### Specifications Published.

7,066. *May 7th*, 1890.—"Shutters." W. G. Tweedy, 8, Athenæum Terrace, Plymouth.

The time of exposure in the case of drop shutters is regulated by a falling bob or weight, which is allowed to fall any desired part of the length of an attached tape before it acts on the shutter. The length of tape to be let out for a certain exposure can be calculated from an equation which involves the vertical dimension of the exposure aperture, and the weights of the shutter slide and bob. Modified arrangements are described in which the dimension of the exposure aperture may be variable, and the length of the tape constant; also in which the shutter slide may be in two parts connected by a length of tape which determines the dimension of the exposure aperture.

7,236. *May 9th*, 1890.—"Cameras and Change-Boxes." E. S. Miller, 11, Bath Road, Bedford Park, Chiswick, Middlesex, and E. C. Hawkins, 5, High Street, Bloomsbury, London, W.C.

In the hand, &c., camera is fitted the changing mechanism frame, consisting of a base and side vertical supports at the back, connected by a cross piece. The supports are fitted with guides, on which the projections of the sheaths rest. The notches in the sheaths also engage with the guides, thus preventing displacement of the plates in a vertical direction until the notches escape from the parallel part of the guides. The plates, which, to begin with, are placed on the guides, are pressed forward by a compound spring towards the exposure stops, which consist of projections and notches on the guides. The exposed plates are intermittently lifted off the guides by oscillating spring arms pivoted to the flanges of the shaft, actuated from the outside of the camera by a key, and are deposited, face downwards, in a well, formed by a front piece, side pieces, and a movable back, which latter is actuated simultaneously with the arms to facilitate the dropping of the plates, and to press them compactly together. The projections on the sides trip the plates off the arms.

7,453. *May 13th*, 1890.—"Printing." A. G. Green, 5, Thistlewaite Road, Lower Clapton, London, C. F. Cross, and E. J. Bevan, both of 4, New Court, Carey Street, W.C.

Relates to what is known as the "primuline" process. The paper, or textile fabric, &c., is treated with a diazo compound, and is exposed under a negative, &c., the resulting image being developed by an amine or phenol, &c., solution.

7,489. *May 14th*, 1890.—"Cameras." C. C. Vevers, 12, Market Street, Briggate, Leeds.

The back has a vertical and horizontal swing. To the sides of the baseboard are fitted sliding pieces, provided with slots, to which struts, pivoted to the back, can be attached by screws. The struts are also provided with projections, which engage in recesses in the pieces. For a vertical swing a screw, which passes through a curved slot in the strut, and engages with a nut in the camera back (or *vice versâ*), is provided. A horizontal swing is obtained by moving one of the pieces in advance of the other.

Received.—From Gauthier-Villars, Paris, "Manuel de Ferrotypie," by Henry Gauthier-Villars. It consists of thirty-six pages divided into six chapters, embracing the various manipulations involved in the production of ferrotypes, the closing chapter dealing with their applications.

## Correspondence.

MADDOX TESTIMONIAL.

Sir,—Propositions have been made through the columns of one of your contemporaries to raise a testimonial to Dr. Maddox, and we think the discussion of such an important matter should not be confined to the columns of one journal, but that the whole photographic world should be stirred up to take a lively interest in the scheme. Our present-day photography owes all to Dr. Maddox, and we trust to see a subscription list worthy of the occasion. We have contributed to the fund, and urge all to follow suit. The Britannia Works Co.

*Ilford, London, E., October 16th.*

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Sir,—The following are the lantern arrangements at the Society's Exhibition, 5a, Pall Mall East, for the coming week :—Oct. 24th, B. J. Edwards, Esq., on "A Tour in New Zealand"; Oct. 26th, lantern display by the Field Club; Oct. 28th, J. R. Wright, Esq., on "Our Village"; Oct. 29th, lantern slides by E. G. Lee, Esq., and J. T. Field, Esq.; Oct. 31st, lantern display by the Photographic Club.

The next technical meeting will be held at the Gallery on Tuesday, Oct. 27th, at 8 p.m., when the apparatus in the Exhibition will be explained. H. A. Lawrance, *Asst. Sec.*

50, *Great Russell Street, Bloomsbury, W.C., Oct. 20th.*

## Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting of this Society held on the 15th inst. Mr. F. A. Bridge occupied the chair.

The Chairman showed a photograph of the interior of a building, in which it had been necessary to use great precautions to prevent halation. He found that the ordinary thin coating of burnt sienna proved quite insufficient, but, on repeating the exposure with a plate backed with caramel mixed with the burnt sienna, he had obtained a very satisfactory result.

Mr. A. Haddon had coated a place on one side of a prism with burnt sienna, and an adjoining place with the caramel mixture. The amount of light absorbed by the caramel portion was very great in comparison to that absorbed by the sienna.

Mr. A. L. Henderson showed a negative by Mr. F. York, of the interior of a saloon at Monte Carlo. It was disfigured by some general dimness, and he enquired the probable cause of this effect.

Mr. A. Cowan said undoubtedly there was damp on the lens.

Mr. York said that was so. After waiting till the lens had acquired nearly the same temperature as that of the saloon, and taking another plate, the image came out clearly.

Mr. Henderson showed some negatives which were very weak, which, he said, showed some reversal of image. He attributed this to the dampness of the place where they had been exposed, and stated that he had prevented that evil by soaking the plates in a solution of carbonate of lithium.

Mr. Cowan thought that, as in Mr. York's case, the weak, foggy character of the negatives was due to moisture on the lens.

Mr. J. S. Teape showed some further illustrations of reversals by over-exposure, in continuation of the experiments described at the previous meetings.

A large number of slides was put through the lantern, and a selection made of those that were to be sent to the Pall Mall Exhibition.

Camera Club.

On October 12th there was a lantern exhibition at the Camera Club, when slides were shown by Messrs. Ferrero, Matthews, Fitz-Payne, Chang, Bridger, Barton, Lysaght, and by Dr. Patterson and Major Tagart.

On Thursday (Rev. F. C. Lambert in the chair) Mr. Andrew Pringle delivered an address on "Bacteria Photographed." Mr. Pringle gave a brief and popular account of bacteriology and its classifications, and illustrated his subject throughout with a large number of slides.

A discussion followed, in which Dr. Patterson, Messrs. Mills, Charters-White, Elder, and the Chairman took part.

On Monday, October 26th, lantern slides will be shown, and on Thursday, October 29th, Dr. Patterson will read a paper, illustrated with lantern slides, on "Animal Photography with a Hand-Camera."

Putney Photographic Society.

*Thursday, October 15th.*—The winter session was opened this evening, under most favourable circumstances, by a lecture on "Illustrated Journalism," delivered in the Local Assembly Rooms, High Street, by Mr. T. C. Hepworth, F.C.S., before an audience numbering fully 350, mainly friends of the members of the Society. The Rev. L. Macdona presided, and in the course of his remarks touched on the formation of the Society last December, and its steady growth and progress.

The Lecturer, who was received with applause, commenced by explaining the production of a daily newspaper, and the important part played by photography in the reproduction of illustrations. The pictures thrown upon the screen, which were the work of the lecturer, and to which full justice was done by the fine triple lantern lent by Mr. Steward, were heartily applauded, the first being of a two-column paper published in December, 1679, called the *Domestick Intelligence*; another, that of Nelson's funeral car, *Times*, 1806 ; another of a paper giving an account of a murder done by one Daniel Good, a resident of Putney. He spoke of the modern wood engraving taken from the weekly *Graphic*, describing the entire manufacture of paper, hand and machine-made, from the collection of rags, esparto grass, straw, wood, &c., through the numerous stages to the production of the finished article. He afterwards showed a view of the large paper mills at Swanley, Kent, which was followed by a description of the printing and publishing of the *Daily Graphic*, showing pictures of the two types of printing machines, capable of turning out 10,000 copies per hour, drums of paper 3½ miles in length passing through, which occupied but fourteen minutes. He then traced the progress of journalism down to the present day ; showing sketches received from war correspondents during the last siege of Paris, and Soudan war.

At the conclusion of this interesting lecture a hearty vote of thanks was proposed by Dr. W. J. Sheppard, seconded by Mr. E. D. Purcell.

Mr. Steward's representative then exhibited some fine slides, amongst which "The Wreck," with lightning effect, "Westminster Abbey," and "Bridge of Sighs," with day, night, and moonlight effects, call for special comment.

The "Club" single lantern and other apparatus was on view. A vote of thanks to Mr. J. H. Steward and the lanternist, proposed by Dr. J. F. Farrar, closed the proceedings.

Next meeting, 31st October, "Bromide Demonstration" by the Fry Manufacturing Company.

Richmond Camera Club.

At the annual general meeting, held on October 16th, Mr. F. P. Cembrano, junr., in the chair, the committee presented their annual report for the year ended August 31st, 1891, of which the following is a summary :—

The Club was formed on July 7th, 1890, under the name of "The Richmond Amateur Photographic Society," which, at a special general meeting, was altered to the "Richmond Camera Club," and the rule excluding professional photographers was rescinded. The meetings of the Club, which were formerly held fortnightly, are now held weekly, having a fair average attendance. Demonstrations of several photographic processes and appliances have taken place at intervals, as well as exhibitions of lantern slides. A lecture given by the president, Major J. Fortuné Nott, in aid of the funds of the Richmond Hospital, resulted in a nett balance of £4. It is proposed to hold the first annual dinner on Monday, Nov. 23rd, at the Greyhound Hotel, Richmond, and a *conversazione* early in 1892. Fortnightly outings were held during the season, but the attendance was meagre, due, perhaps, to the unfavourable weather.

The following members have been elected for office during the ensuing year :—*President*—Mr. F. P. Cembrauo ; *Hon. Sec.*—Mr. P. Ennis, 28, Halford Road, Richmond, Surrey ; *Hon. Librarian*—Mr. G. Ardaseer ; *Committee*—Messrs. R. L. Kidd, E. G. Richardson, C. E. Hodgkin, C. H. Davis, aud A. C. Hunter.

A vote of thanks was uuanimously accorded to the late secretary, Mr. E. G. Richardson, for his valuable services duriug the past year.

Midland Camera Club.

*October 16th.*—Geueral meeting in the new club-rooms (Queen's College), Dr. Hall-Edwards in the chair.

The rules drafted out by the provisional committee were adopted, and, upon readiug the names of geutlemen who had expressed their desire to join, together with three or four handed in at the meeting, the Chairman congratulated the Club upon starting with a membership of fifty. Commenting upon a remark that appeared in one of the photographic papers, that the Club would possess no members of any influence, the Chairman said he would call attention to the following names:—Prof. Allen, M.A.M.B., Gilbert Barliug, F.R.C.S., Wm. Dudley, M.R.C.S., Rev. J. Henry, F.R.G.S., George H. Hart, L.R.C.P., Rev. W. Rigby Jubb, M.A., Rev. Hubert Kingdom, H. R. Leech, M.R.C.S., Jordan Lloyd, F.R.C.S., C. A. Lumley, M.R.C.S., W. W. J. Nichol, D.Sc. (of Kallitype fame), Dr. Ratcliffe, of the General Hospital, Rev. E. J. Nurse, Henry Sturmey, Gilbert Smith, M.R.C.S., Priestley Smith, M.R.C.S., &c. They also had three lady members. He thought that was a pretty influential list to start with.

The electiou of officers resulted as follows :—*President*—Dr. Hall-Edwards ; *Vice-President*—Rev. J. Henry ; *Hon. Secretary*—Mr. Walter D. Welford : *Hon. Treasurer*—Mr. S. G. Masou ; *Committee*—Messrs. H. R. Leech, W. W. J. Nichol, Edw. Morton, Rowland White, and Dr. Ratcliffe.

It was resolved to form a section for the discussion of matters relating to the application of photography to manufacturing industries. The club-roouis were hung with pictures, "Carolling" and "Lobster Boat," by Mr. H. P. Robinson ; "When the Day is Far Spent," by Rev. F. C. Lambert ; some excellent micro-photographic frames, by the president ; landscapes by the hon. treasurer, and hand-camera pictures by the hon. secretary. There was also a large display of lautern slides.

At present the rooms are not fully furnished—the dark room requires filling up, &c.—but by means of a private loan fund which has been inaugurated the committee will be able to very quickly get everything into thorough working order without trenching upon the current year's receipts. The rooms, however, are open at all hours to the inspection or for the use of members.

Toning after Fixing.—Toning formulas are very uumerous generally, and in the best one of the methods used the prints are first toned, then almost immediately fixed with hyposulphite of soda. Numerous baths have also been proposed by which the prints are toned and fixed at the same time. These baths being generally acid, should be rejected, as they may produce a more or less sulphuratiou of the prints. It may be useful, notably when there is no toning bath at hand, to first fix the prints, and afterwards tone theni after a certain lapse of time. Here is a formula of a bath that may be used with advantage : — Sulphocyanide of ammonium, 30 grammes ; chloride of gold, 0·30 gramme ; caustic potash, 0·30 gramme. This bath may be used immediately, as the caustic potash provokes the instantaneous dissolving of the red precipitate which is formed when the gold salt is added to the sulphocyanide. It keeps well, acts very rapidly, and allows toning up to blue-black. Tones of a darker purple are obtained by using five grammes of carbonate of soda in place of the caustic potash. This bath may be diluted with two or three parts of water when using paper sized with non-albumenised starch ; in this case it is extremely economical. It may also be used before fixing, but theu it acts very slowly, and has a tendency to give pinkish toucs. This toning should be followed by abuudant washing.—M. Mercier.

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column should be addressed to Mr. John Spiller, F.C S., 2, St. Mary's Road, Canonbury, N.

All Communications, except advertisements, intended for publication should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

A. H. (Manningtree).—*Lens for Quick Exposure.* The details asked for have been sent on by post, leaving the choice to you. In fine weather the first-named ought to be quick enough for street scenes.

Philologist.—*A New Word.* In common with yourself, we observed a new departure ou the front page of the *Graphic* of 26th ult., where the portrait group of the Duke and Duchess of Fife and child is said to be "photoed" by Messrs. W. aud D. Downey. This word would appear to be the past participle of the verb *to photo*, and we may expect to hear, in like manner, of other subjects being "lithoed" in the journal devoted to the exposition of the graphic arts. The Americaus may not object to this inuovation, but it is hardly fair English.

C. M.—*The Aerial Graphoscope.* Mr. Eric Bruce's new invention was practically demonstrated before a large audience at the Pall Mall Gallery on Saturday evening. It constitutes an exceedingly interesting novelty—so much so that it is proposed to repeat the exhibition on each succeeding lantern night. The truth of Mr. H. A. Lawrance's statement as to its being a good experimental proof of the persistence of vision becomes at once apparent by turning the head quickly whilst observing the aerial image. With black velvet as a background, the effect of rotundity is also truly remarkable.

Ella.—*The Bude Light.* Passing a stream of oxygen from a pressure cylinder up the central aperture of an Argand gas burner certainly gives a very brilliant light, but we fear that the excessive heat thus generated would cause the destruction of many a gas-glass during your experiments. However, try it, and report the result.

J. B. (Exeter).—*Decayed Leather.* From your description, it appears probable that heat incautiously applied whilst the leather was still moist was the determining cause of injury to the folding bellows of your camera. After being wetted, leather must only be wiped and left to dry spontaneously in the air, or it is sure to become perished and rotten if put too near a warm fire.

Subscriber.—*Photo-Benevolent Lantern Soirée.* This day fortnight, Friday, November 6th, is the date fixed for holding the annual benefit at the Pall Mall Exhibition, the sanction of president and council having already been given, and an attractive programme is now being arranged.

W. E. D.—*Silver Reduced from Residues.* The small quantity of lead will do no harm. It may have got iu from the zinc employed, unless you used a specially fine quality. Ordinary spelter and zinc plates usually contain from half to one per cent. of lead, and sheet copper always shows evidence of the same impurity. *Old Standard Silver.* It is surely easier to determine the amount of real silver by chloride of sodium solution, iu the presence of a trace of potassium chromate, than to proceed iudirectly by estimating the amount of copper.

L. T.—*Faded Opalines.* You are not the only victim, for it is a common experience. A silver print mounted against glass with gelatine seems to fade more quickly than those to which the glue or gelatine has beeu applied only at the back.

G. B. B.— *Sun Spots.* The most recent information, with some fine illustrations, can be got from Sir Robert Ball's "Story of the Heavens," uow being published in serial form by Messrs. Cassell and Company.

## Subscriptions to the Photographic News.

Including Postage to any part of the United Kingdom :—
Yearly...10s. 10d. | Half-Yearly...5s. 5d. | Quarterly... 2s. 9d,

I# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1730.—*October* 30, 1891.

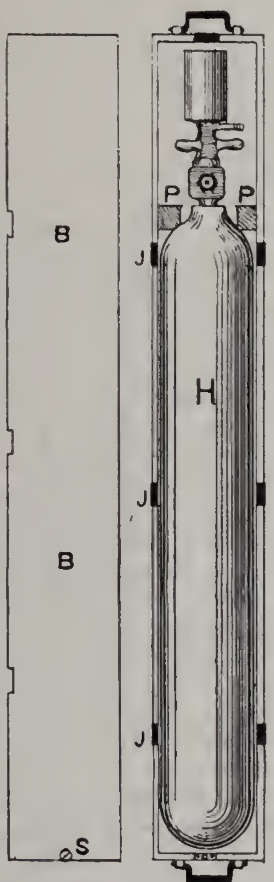
CONTENTS.



## GAS CYLINDERS IN TRANSIT.

Now that the lantern season is commencing, and lanternists, both professional and amateur, are busy in looking up and renovating the apparatus which has been lying dormant for so many months, it may be as well if we devote some attention to a matter which, important in itself, has not as yet met with the attention which it deserves. The cumbrous gas bags have, in the majority of instances, been discarded in favour of the far more convenient bottles, or cylinders, of compressed gas, and, although a few professional workers still swear by the bags, among whom are those who go in for thunder and lightning "effects" with three-decker lanterns, the majority of lanternists who are content with a single, or, at any rate, a bi-unial lantern, carry with them "bottles" and regulators, or "bottles" without regulators. The matter to which we refer is the manner of transporting these cylinders from place to place, and the most convenient manner of disposing them while they are furnishing energy in the form of light to the lantern. We speak of them in the plural because we are in the habit of using the mixed jet fed by two cylinders, but our remarks will apply with equal force to the use of the single cylinder and the blow-through or safety-jet.

According to the report of certain experiments carried out some months ago at Birmingham, a fully charged gas cylinder, although its thickness is but an eighth of an inch, can be knocked about, bent, cast from a height, and otherwise maltreated with impunity, the mild steel of which it is made being of such splendid quality that the cylinder will not only withstand the internal pressure of the gas, which is 1,800 lbs. to the square inch of surface, but is quite unaffected by the severe treatment already detailed. It is, indeed, a matter of every-day occurrence for these cylinders to be sent long distances by train, and we may say that if an article, whatever it may be, has been so carefully manufactured as to remain intact after having been through the hands of the average railway porter, it must be Samson-like in its tenacity. At the same time, the careful worker will always have in his mind the fact that he is dealing with a machine which contains within itself a vast amount of pent-up energy, and that a nasty knock in the right place might cause its release. The chances are probably a million to one against any accident of the kind. Still, it is the unexpected that always happens, and it behoves him to be careful. But, setting aside all risk of fracture, the naked cylinder is an awkward thing to handle, for there is no handle by which to take hold of it, and it must be carried in the arms like a baby. It is, therefore, advantageous in many respects to have a case for each cylinder in use, and to the best form which this case should take we have devoted some attention. As we have had the cases or boxes which we designed in use for many months, during which they have covered many miles in railway vans and other vehicles, and as these boxes have been found to be most convenient, we will now describe them for the benefit of those who care to adopt the same system.




The cylinder which we employ—we will deal with one only for the sake of simplicity—is of sixty feet capacity, and when crowned with a Beard regulator measures nearly four and a-half feet in length. Its containing box is of such a size as to admit the cylinder and regulator without leaving any room to spare, except half an inch clear above the top of the regulator, as shown in the annexed diagram. To prevent the cylinder shifting upwards, two strong posts are affixed to the internal sides of the box, and these just catch the shoulders of the gas vessel and keep it firmly in its place. These posts, marked PP in the illustration, have a farther use. When it is desired to attach a gauge to the cylinder for the purpose of ascertaining the quantity of gas available, the vessel must be removed from its box and the regulator detached. This can easily be done by lifting the cylinder clear of the posts PP, and pulling it forward in the direction of its head. It can then be allowed to rest on the projections PP, and will be held firmly there by its own weight while the necessary adjustments are being made. The black rectangular marks shown on each side of the open box are ┏-shaped clamps which are screwed firmly in place, and which permit the lid of the box BB to slide beneath them. It will be observed that the lid has three openings cut in one of its edges. These have the same distance between them as the clamps J, so that when these openings come opposite to the clamps, the lid can be removed without sliding it the whole length of the box. When this lid is wholly closed over the box, it is secured for travelling by a cheese-headed screw S, which is received into a plate provided for it at the end of the box. The india-rubber tube for attaching the cylinder to the lantern is a fixture on the regulator (not shown in the diagram). It is about eight feet in length, and conveniently lies along the edges of the cylinder, down one side and up the other. The only other feature of this box which need be mentioned is a simple but very necessary one, namely, the presence of a strong wrought iron handle at each end—something that the hand can grasp well, and that will resist a good deal of knocking about.

It is the fashion generally to tie the cylinder or cylinders to the leg of a table, so that the regulator is upright. There is no necessity for this, as the apparatus works quite as well when lying on its side. It is in this latter position that we use it, for the boxes containing the cylinders lie side by side on the floor, between the legs which support the lantern-box and lantern. All that the operator has then to do is to remove the securing screws from the lids, slide the lids a few inches down the boxes to expose the regulators, take out the india-rubber tubes, and make connection with the lantern.

It may be added, in conclusion, that there is plenty of room in the boxes, round about the regulators and above the shoulder-pieces of the cylinders, to accommodate the key, spanner, and other things that may be required in dealing with the gases. These are best carried in cloth bags so that they cannot get loose in transit. We also make it a practice to carry a couple of screw-nozzles to fit the cylinders in case an accident should happen to the regulators. These, happily, we have never yet had occasion to employ.

## ON THE USE OF SMALL STOPS.

BY W. H. WHEELER.

It has been the fashion, particularly among artists, to deprecate what they considered to be the abuse of *small stops*. One gentleman, I remember, recommended us all, in the interests of art, to "throw away our wide-angle lenses, and burn all our small stops." The intention of this heroic advice was excellent. The author of it attributed faults in the perspective of form to the use of wide-angle lenses, and deficiency of atmosphere to that of small stops. No fault need be found with his criticism of results, but his judgment as to causes, and advice as to means, is quite another thing. This is properly our province, and my object in the present paper is to inquire, as thoroughly as I am able, into the advantages and drawbacks attending the use of small stops.

They certainly require special care in keeping stray light from the camera, because the longer the exposure, the longer does this stray light act on the plate; but then, cameras should *always* be light-tight. Again, some workers are slow to realise the rapid ratio at which a proper exposure increases as the stop is reduced, and an under-exposure, with its accompanying want of atmosphere, has thus come to be naturally associated with a small stop. The association, however, is not a necessary one; *all* plates need a sufficient exposure, if breadth and atmosphere are desired. But when a sufficient exposure is given, and when stray light is so carefully shielded from the lens and kept out of the camera that this full exposure does not fog the delicate detail which should be perceptible in the shadows—though not too obvious—then, especially when a large scale is attempted, these much-maligned small stops may be found to be the very life of the art of depicting, in all its native delicacy and profusion of detail, nature in repose.

We will first inquire, what is the optical aspect of the question? Those who, accustomed to the use of telescopes or microscopes—especially the former—have learned to appreciate thoroughly the advantages of aperture in their object-lenses, and perhaps unlearned much of their primitive faith in high magnifying powers, have yet a new lesson before them when they turn their attention to the work of photographic lenses. Oblique errors acquire here a new importance, and the novel power of compensating for reduced light by increased exposure is not at first realised. Neither do we at once appreciate the fact that our accustomed visual power of better distinguishing in the telescope—though only by glimpses—*well illuminated* details amidst surrounding haze of atmospheric fluctuation, or even of optical short-comings, than when that detail has been dimmed in clearing the haze by reducing the aperture, is not shared by the photographic image. For this is impressed, not by glimpses, but by a steady gaze; and, after being formed in the negative, it has still to be printed. A similar difference may be observed between an original photograph and a copy; for the soft haze of indistinct definition, or of slight movement—perhaps that of a near branch out of focus—detracts sensibly less from the charm of an original photograph than when that is further hardened and made more coarse by reproduction. The effect of small stops on a photograph has thus comparative advantages not shared by the optical image when viewed directly through an eye-piece. The appearance of the latter when a large stop is used is much more distinct, as well as more brilliant, than in the resulting photograph, whereas with a small stop it does not equally mislead.

Thus, while a longer exposure can compensate us for want of light, the clearance from surrounding haze of error produces even more improvement in the distinctness of definition. Some things, indeed, there are which men have expected from small stops in which they will certainly be disappointed.

They will never make up for careless focussing. They will not make a "rapid rectilinear" lens cover like a wide-angle lens of equal quality and similar focus. They will not cure any kind of distortion. Their value is perhaps greatest with so-called non-aplanatic lenses, in which central distinctness with a large stop has been to some extent judiciously sacrificed to obtain better marginal definition with a flatter field; and when used in taking subjects with which an even delicacy of accurate definition is most likely to be appreciated. But a full appreciation of that delicate accuracy of photographic definition which cannot, without a small stop, be generally distributed among various planes—so answering to the ciliary accommodation of natural vision; or over a considerable angle of view, corresponding again with the natural perceptive process of distinct and successive vision on the "fovea"—varies very much with different people. The painter, whose longing is for ideal beauty and for the effective presentation of his own conceptions, does not realise the almost universal consent with which the general public, who desire rather to recall associations than to obtain original ideas, prefer such detail, even when irrelevant in itself, as seems to carry with it the stamp and proof of *reality*, trusting, probably, to their own memories or imaginations for the necessary ideal element; and he very naturally pooh-poohs the minute delicacy of definition which the very nature of his means precludes him from obtaining with due subordination, for which, perhaps, his own particular public care less, and which, therefore, the judicious artist does not care to spend time in attempting, although he has frequently, for want of it, to substitute a conventional imitation for the natural texture a good photograph can render. Then there is the inattentive observer, and the observer whose eyesight has begun to fail him. But the nature and mechanical perfection of our means are such that, for a really good photograph of still life, our attention need never be diverted from study of artistic effect in lighting or composition, and we need sacrifice nothing but a little time in the exposure, to combine with such qualities as artists appreciate, and which satisfy inattentive or dim-sighted observers, that delicate optical definition also, a full appreciation of which rewards the attentive observation of a sharper vision. It is all very well for some artists to deprecate a close survey by saying that a picture is not intended to be smelt. Most certainly not! That, at least, is abundantly evident, sometimes to more senses than one. But photography is a different thing, because we can, as the artist cannot, easily so produce our pictures as that their details may reward the keenest sight, and yet a harmonious general effect equally gratify an observer at the proper distance. I would, therefore, invert the common way of putting the case, and for the question, how *large* a stop can I use? I would ask instead, how *small* a stop have I time and convenience to use? Thus fully to recognise delicate accuracy of definition over the whole picture as a good thing in itself, and worthy to be sought for its own sake.

But, as the time required by a smaller stop increases very fast—at least, as fast as the area of the stop (that is, of course, as the square of its diameter)—we ought to separate in our theory those cases in which contingent or certain movement may or must injure the result, or, as sometimes in portraits, a tired expression supervene; also cases where a passing phase of incident or of lighting needs to be secured—including, of course, the whole body of "shots," or instantaneous pictures. In all such cases the choice between inaccurate definition and insufficient exposure on the one hand, and the possibly injurious effect of movement or the inconvenience of a long exposure on the other, must be left to the worker's own judgment as to each individual case. For portraits, the intelligent attention of photographers is already so well directed to the subject that only one case appears to me to call for remark. It is that of those who, feeling sure that it is right to keep well away from their sitter by using a long-focus lens, even for heads when wanted on a large scale, may yet be deterred, fearing such want of *depth* as would compel a smaller stop—slower than desirable. They have been told that longer focus lenses have far less depth, and may not be aware how fully a greater distance from the sitter compensates this.

The correct rule really is that, with the same *scale of image* and the same *intensity* of lens, the depth of focus is also precisely the same, *whatever be the focal length used;* and the sound and important reason why we should never photograph, even a face, from a very near standpoint, can scarcely be repeated too often. It is not merely that a longer focus lens covers better—though this is important too—but it is to prevent the face or figure from being, as artists call it, "out of drawing." For when we look at any person from a very close standpoint, we see the figure far more *as we know it to be*, than as corresponding exactly to the varying distances of its different parts from the eye, this truer perception of the figure as it really is being greatly aided by our natural habit of *running the eye* over the whole near figure as it looms, irregularly large, on our sight, so giving time and opportunity for actual memory, or for preconceived ideas, to modify our sensations as they are mentally interpreted, and so form themselves into a *perception* of the whole. It is a means beneficently provided, helping us to retain that constant sense of true form so necessary for recognition, as well as for our appreciation and feeling for harmonious beauty, which sense of true form might otherwise be hardly able to sustain itself against the continually changing and distorting variations of apparent forms, as the close proximities of ordinary life necessarily present them to crude sensation.

On the other hand, when we look only at the photograph, our perceptions not being corrected by so full a sense of reality, or so favourably modified by running the eye over it (the figure, being so small, is embraced by the eye almost at once), it is seen pretty simply as the lens has depicted it; that is, with each different part or feature presented on *different scales*, corresponding precisely to their different distances from the eye. And, of course, this is just what critical observers, accustomed to the *true* face or figure, know it *not to be*. Fortunately, an increased distance from the sitter practically corrects all faults of this kind so rapidly, that I believe the most critical artist does not recommend in general more than fifteen feet or so for moderate sized portraits, less sufficing for heads only. But how many are taken from less than half that distance? Perhaps I may, to many readers—accustomed either to uncritical judges, whose perceptions of true form are blunt and inaccurate; or to others, who, while conscious of something not right (they know not what) set all down as a fault somehow inherent to photography—appear to be making too much of a small error. But in portraying the human form, small errors are not necessarily slight errors. A very minute change of proportion may make a serious change in *expression*; and respect for our art in its highest and almost ideal vocation—the portraiture of the human face and form—should make us scrupulous as to error directly affecting form in our portraits. It is well to remember also that the principle applies with equal force to photographing statues or busts; and that though these subjects reward the use of small stops by such full depth of focus and general accuracy of definition as is impossible with a living subject, yet small stops will cure no kind of distortion.

*(To be continued.)*

## PRINTING ON SILK.

The following directions for printing photographs on silk we take from the columns of the *Scientific American*. It is recommended to use china silk of a ground tint suitable to the subject in hand. The silk must first be well washed to free it from dressing, and then immersed in the following solution:—

| | |
|---|---|
| Common salt ... ... ... ... | 4 grammes |
| Arrowroot ... ... ... ... | 4 ,, |
| Acetic acid ... ... ... ... | 15 c.c. |
| Distilled water ... ... ... | 100 ,, |

The arrowroot is dissolved in the water by the aid of a gentle heat, and then the other ingredients added, and finally—

| | |
|---|---|
| Tannin... ... ... ... ... | 4 grammes |

dissolved in—

| | |
|---|---|
| Distilled water ... ... ... | 100 c.c. |

Are also added, and the mixture filtered. The silk is allowed to lie in this salting bath for three minutes, hung up to dry, and afterwards sensitised on a silver bath as follows:—

| | |
|---|---|
| Nitrate of silver ... ... ... | 3 grammes |
| Distilled water ... ... ... | 25 c.c. |
| Nitric acid ... ... ... ... | ½ drop |

The silk is floated on this for one minute, then hung up till surface dry, and finally pinned out on a board till thoroughly dry. It is printed in the usual way, and washed and toned as usual, though we have found the mixed acetate and sulphocyanide bath give the best tones.

Retribution.—

A beautiful maiden, reading a book;
A picturesque landscape, a babbling brook.
A man with a kodak in secret prepares
To picture the maid as she sits, unawares.
Her two strapping brothers were chancing to pass,
Saw the man with the kodak, and also the lass.
They rolled up their sleeves, threw off hat, coat, and vest;
The man pressed the button, they did the rest.—*Judge.*

We beg to thank "Watchman," in the *Beacon*, for a paragraph which concerns the Photographic News. He writes: "Is not your *confrère* of the *Eye* like the originators of the Daguerre Memorial, a little out in his historical knowledge? At the entertainment given by the American Aristotype Company, at Chautauqua, he proposed the health of Dr. Liesegang and Herr Obernetter as the inventors of "aristo" paper, when, as almost everybody else knows, that honour belonged to the late G. Wharton Simpson, editor of the Photographic News. In August, I think, of 1864, I assisted as an onlooker at the first experiments he made in that direction, and the process was published later in the year in the Year-Book published in connection with that journal, and I know of at least one photographer who took it up then, and has stuck to it ever since."

## THE PRINTING PAPER OF THE FUTURE.*

BY JOHN HOWSON.

Nothing can be more striking to the careful student of photographic history than the fact that albumenised paper, which has, without doubt, been the most widely condemned and least understood of printing processes, should have not merely survived, but be still the process which is most largely used. At all periods during its existence its inherent want of permanency, and its uncertainty and other demerits, have been the constantly recurring themes of discourse at our meetings and in our journals. To have survived these onslaughts, it is clear that its drawbacks have been balanced by some real merits. Its good points are readily pointed out, and, when found, will as readily explain the apparent anomaly of so universally condemned a process being at once so widely used and so long-lived.

I cannot better explain the position than by quoting from an article written in 1887 by Mr. Herbert S. Starnes. In that article he discusses this very question, "What will be the printing process of the future?" After writing of the question of permanency, and joining the chorus of condemnation, he goes on to say: "Next to permanency is that of range of tone and delicacy of image. Here there is no doubt that albumenised paper holds first place. With a suitable negative, platinotype or bromide emulsion papers no doubt run it close, but, as a rule, there is a flatness in the darkest shadows which we do not get in albumenised paper, and there is also a less graduated range of tones from light to dark." After further comparing the various processes, he concludes as follows: "I think I have said enough to show that the printing process of the future must be something different to what has yet been introduced, and that photographers are sensible in not throwing up albumenised paper until they are shown something that can take its place by giving equal results with equal certainty."

To prove that we have to-day such a process as Mr. Starnes looked for within our reach, is my task, and I do not pretend for one moment to rely on my own opinions to prove my case, that gelatino-chloride paper has within it qualities which make it, as I claim, "the printing process of the future."

Having thus stated my case, I may, with a view to its better understanding, refer to the historical aspect of the paper. Its forerunner and prototype was collodio-chloride paper. This paper, produced as long ago as 1865, was known to the photographic world as Simpson-type, and, though in its day it had considerable success, and even now is not altogether defunct, there are drawbacks to its use which make it fall short of that perfection which is aimed at. As gelatine began to oust collodion for negative plates, so, naturally, the attention of experimenters in printing processes was directed to the use of gelatine as a vehicle for the silver salt in that special branch.

As is too often the case, the world was slow to value at their full worth these discoveries, and the matter had, at the moment, no commercial outcome. Photographers here and there have prepared their own paper after one or other of the formulæ given, but such individual effort to utilise the process could but be called a living death. Now-a-days everything photographic, to be of widespread use, must be prepared on a large commercial scale, and be

* Abstract of a paper read before the Photographic Society of Ireland.

readily obtainable at every street corner, so that the consumer can buy what he needs readily and at a low price. Life is too short, and the exigencies of business life too exacting, to allow time for home preparation of any article of general use. Germany has the credit of first preparing the paper on a commercial scale, and Herr Obernetter is the pioneer of this business; not only so, but until to-day his paper has been looked on as the best of its kind, and has been the one most largely used. Other Continental and American makers have introduced similar papers, and within a very recent period Mr. Walter Woodbury has been the means of inducing an English firm to take up its manufacture, and by his writing in the journals has done much to popularise the paper, and make its merits widely known. So much for the history of the past, condensed into a few brief sentences.

I may readily admit that, given certain properly adapted negatives, other printing processes yield most admirable and possibly superior results; but it is the common lot of photographers to produce a wide range of negatives, varying as to quality and characteristics. To say, therefore, that we have got the printing process of the future is to say that we have a paper that is adapted equally for all such negatives. Not the cleverest and most able photographer that ever uncapped a lens or snapped a shutter can say to himself: Now this negative I am about to take shall have such-and-such characteristics to suit it for such-and-such a printing paper. By infinite care he may, on occasion, produce negatives such as he wants. If he, as a specially able man, with time at his disposal, can with difficulty succeed in this respect, what must be the position of the rank and file? No! I say boldly that, speaking of photographers as a whole, a negative is what light, and subject, and a dozen other incidentals make it, not what the photographer would wish. Hence, to suit a varying quality of negative, we have absolute need of a printing paper which is adapted to yield the best results from these negatives, be their quality what it may. Such a paper, I say unhesitatingly, is only possible if it is so made that the image is retained on the surface by some vehicle, whether it be albumen, collodion, or, as in the paper under discussion, gelatine.

It would only be natural for some objector to interpose here and say: If the merits of gelatino-chloride paper are so great, and known as far back as four or five years ago, why has it not made greater headway, and become more generally used? This is a most natural question, and the reply is equally apt. Albumen paper had the necessary advantages: it held command of the field, and it was readily obtainable; and, above all, was so cheap that its want of permanency and other demerits could not weigh in the scale against it. Since the world began, it has ever been thus with all things new. All changes have been gradual. Though Obernetter, Liesegang, and others have had papers offered to the public for some years, their sale was hampered in more than one way, the most serious of which was that of price, and it makes strongly for my point that, spite of this drawback, the paper has been used to a very considerable extent both in Great Britain, the Continent, and in America. There are photographers of all grades who, despite the great extra cost, have recognised its high merits, and used it largely, if not solely, in their work.

There must be unanimity of opinion that, as to permanency and results, gelatino-chloride paper answers Mr. Starnes' postulates, and so far may be entitled to the claim to be the printing paper of the future. The only other quality named by Mr. Starnes was ease of results, and I cannot conceive anything more convincing than practical demonstration.

I have half-a-dozen prints made on the new Ilford paper. They are not at all deeply printed, as they lose little in the toning and fixing operations. These prints, if kept from light and air, may be kept for days or weeks unfinished.

The first process is thorough washing for ten minutes in running water, or several changes. Having washed all we propose to tone, they are laid by our side in a dish of water. It will be interesting to note here that the prints have not the slightest tendency to curl when wet, a great improvement on both albumen and previous gelatine papers. A clean dish is ready, and the bottle of toning solution taken in hand. This toning bath is one of the simplest imaginable, consisting of—

| | |
|---|---|
| Water ... ... ... ... ... | 16 ounces |
| Sulphocyanide of ammonium ... ... | 30 grains |
| Chloride of gold ... ... ... | $2\frac{1}{2}$ ,, |

This is the best bath. The paper lends itself to use with almost any of the various formulæ given for this class of paper, whether simple or combined. I must say, however, that it will be wise to adhere to the bath given. For my own part, I would refrain from recommending any combined bath that I have yet seen. I should be afraid that either acid or sulphur toning would accrue, and with that a want of permanency. Some of the baths recommended are glaringly open to this charge, and are to be rigidly avoided. Immersing the prints in our toning bath, we make sure that they do not cling to each other, and keep them constantly moving. In three or four minutes some of them—dependent on the negative used—will be sufficiently toned, and are taken from the dish and passed into plain water. The progress of toning is judged by transmitted light, and if an ordinary photographic purple colour is required, on looking through the prints there should be just a trace of warmth in the deepest shadows. On the surface the print will appear overtoned, but this appearance is lost on fixation. If warmer coloured prints are wanted, of course they are withdrawn from the bath at earlier stages. By this simple means the widest variety of colours is obtained, from a warm brown to the coldest purple. Beyond this, and the fact that prints dry always a shade colder than they appear when wet, judgment is not required to foretell the colour of the print when finished. It may also be mentioned that prints dry with more apparent detail and vigour than they show when wet. This is due to the semi-transparency of the paper when in this state. The finer detail that scarcely shows against the transparent paper appears boldly when the paper becomes dry and solidly white.

Presuming now that the whole of our prints are toned, and all in the washing water, we will give them a thorough good rinse. Fixing is the next process, and fresh hypo should be used for each batch to be fixed. In a bath of hypo 3 ounces, water 20 ounces, fixation is complete in eight or ten minutes. Then there remains only the usual thorough washing to eliminate the hypo. We find two hours in running water sufficient. More time should be given only where changes of water are available.

The nature of the gelatine used is such that in all ordinary cases the use of alum is quite unnecessary. Should the film, however, show a tendency to soften, owing to excessive heat, or want of proper care in working, and also in *all* cases where the prints have to be subsequently burnished, the alum bath should be used. This should be done between the first washing and the toning. The alum bath should be 4 ounces alum to 20 ounces of water, and five minutes will suffice to harden the prints. They should be thoroughly well washed before toning is proceeded with.

This paper lends itself to every variety of surface, and does not present any difficulty in finishing or mounting in the ordinary way. Hung by a clip at the corners, and allowed to dry naturally, they are mounted with ordinary starch paste, and yield pictures considerably more presentable than albumenised prints. If prints are to be burnished, dry thoroughly, mount as usual, pass through the hot roll exactly as usual, using Castile soap, and a little spirit as a lubricant.

Of the methods of obtaining highly enamelled or matt surfaces by squeegeeing down on glass I need scarcely speak, the subject has been so often expounded; but results are shown on the table, and their variety and beauty speak for themselves.

Spotting is done as usual, of course bearing in mind that if enamelled prints are wanted, the spotting colour must be protected by a drop of collodion before the prints are put down on the glass.

Thus, gelatine printing-out paper may be fairly said to excel albumenised in beauty of results, in ease of manipulation, and, most important of all, in permanency. In all other respects it equals it, and has none of its drawbacks. There are with it no blisters, no curling, no water-marked edges. The opinions of our best-known men, the practical work of both professionals and amateurs, and its own undoubted merits, thus stamp gelatino-chloride paper as the printing process of the future.

## COMPRESSED GASES.

That we have run ahead of the Americans in the matter of compressed gases will be seen from the following extract from a Chicago contemporary:—

"The convenience of gases compressed in cylinders is so great that for lantern purposes no one now employs bags where cylinders can be got; but those still used in this country are not nearly as convenient and portable as they might be. Why should we be compelled to transport a mass of metal in the form of a cylinder about 36 by 8 inches, and just about as heavy as a man can lift, for an hour's exhibition, when our neighbours across the water can compress 40 or 50 feet into one not more than 15 by 5 inches? English cylinders are made of mild steel and without seam or join of any kind, from a blank or disc of metal about thirty inches in diameter and three-quarters of an inch thick, by heat and pressure. They are tested by a water pressure of two tons, and generally charged with gas up to 1,800 pounds. Who will be the first in this country to adopt such a convenient cylinder?"

We fancy that we are not far wrong in attributing these remarks to a recent leader in our own columns anent the manufacture of gas-cylinders.

A Problem of the Times.—At the next annual gathering of the photographers of the country, if they will kindly inform us why it is that when an actress sits for her picture she turns her back on the camera and twists her neck so that her chin hangs over her left shoulder, a good deal of the mental strain will be removed from the brain of the agonised public.—*Chicago Tribune.*

## FURTHER NOTES ON SILVER PRINTING.*

BY LYONEL CLARK.

### Failures in Salting.

With the system of preliminary brushing there is but little danger of leaving places or patches untouched by the salting solution—a somewhat common fault—and the only other danger to be avoided is that of allowing any solution to get on to the back of the print. For some time I was troubled with insensitive, or nearly insensitive, spots on the prints when they left the printing frame, of a faint lilac colour, surrounded by a halo of darker colour than the rest of the print. Sometimes these markings would take the form of a line right across the print. The cause of these markings I have now traced; they are entirely and solely caused by some of the salting solution getting on the back of the print and soaking through, when it joins, so to speak, the salting solution on the face. This, therefore, creates a maximum quantity of chloride at this spot, and therefore the silver, when applied, is insufficient to convert all this chloride into silver chloride and still leave an excess of nitrate, and, therefore, insensitive spots are formed. The darker nucleus also is due to the excess of silver chloride at this spot, for since, generally speaking, the darkening is proportional to the amount of silver chloride (providing some nitrate be always in excess), darker patches are formed where this happens. These dark patches, as a rule, only show when, from insufficient floating or a weak salting bath, there is an insufficiency of haloid chloride on the print, as it is evident that if the maximum amount of chloride be applied in the first place, no further addition can make any portion of the print more sensitive or prone to darken. Such places will then either not show at all if an extra amount of silver has been applied, or, if this be deficient, they will show as white, insensitive, or nearly so spots. In any case, however, the greatest care should be taken to avoid any of the salting solution falling on the back of the print.

In my last paper I made a few remarks on the two systems of floating or soaking the paper in the salting baths, and can strongly confirm my first view on the subject. With heavy drawing papers I find floating by far preferable, the method of soaking being a very wasteful and risky proceeding, nearly always requiring double sensitising.

### Silvering or Exciting the Paper.

I have but little to add or extract from my previous remarks. I still find brushing on to be far the most economical and expedient manner of applying the silver, and I find the modified form of Buckle brush I described in my last lecture to be a most valuable aid, and I am greatly pleased with its performance.

I have not found it necessary to make any change in the silver baths I recommended, for they each have their use. For feeble negatives or dull light, or if I intend to tone with gold, I use the Hardwich ammonio-nitrate bath described in my paper on "Platinum Toning" (*Camera Club Journal*, November, 1889). But for the generality of my work, and especially for the intensification process I shall describe later on, I use the silver citrate bath. The plain nitrate bath I have practically discarded, as it possesses no special advantages. The citrate bath is made up as follows:—

| | | |
|---|---|---|
| Nitrate of silver (recrystallised), 60 grains | | 14 grams |
| Citric acid (crystals), 25 grains... | ... | 5½ ,, |
| Water (distilled), up to 1 fluid ounce | ... | 100 c.c. |

* Concluded from page 742.

Paper brushed over with this bath keeps fairly well, and when printed can be kept almost indefinitely before toning. I came across a piece of this paper the other day that I printed for my lecture in December last, and it shows no signs of degradation.

With regard to the subsequent operations of toning with gold or platinum, fixing, &c., I have nothing to add to the remarks and directions given, either in my former paper or in my pamphlet on this subject.

### Failures in Sensitising.

The commonest failure that is likely to happen is to find that the paper, on exposure to light, refuses to darken in certain portions. This is caused by an insufficiency of silver. It is an absolute necessity, as I pointed out in my former papers, that there be some free silver in excess, in order to get a vigorous image. If there be only sufficient to convert the chloride into silver chloride and leave no silver in excess, or if you wash the paper, so as to free it from all other substances, on exposure to light it will be found that this pure silver chloride will only darken very slowly, and assume at the best a faint lilac instead of a metallic brown shade. But if to this washed or pure silver chloride a little free silver nitrate be added, the darkening will be seen to take place at once, and the mixture will blacken to the deepest shade. It is therefore necessary, in exciting paper, to brush on not only enough silver to convert all the chloride into silver chloride, but enough to leave a certain amount still in excess.

This appears to be the commonest source of failure in silver printing, and is much more common—as, indeed, is to be expected—when the paper has been soaked in the salting bath, and I have had many examples sent me. As a general rule, the paper prints out in patches of dark colour, with insensitive places between, showing distinctly where the silver was in excess, and where it was not. It is, therefore, important not to stint the silver, but brush plenty on; indeed, the surface should glisten all over with solution, and when hung up to dry, a few drops should run off at the bottom corner. As a rough guide, I find that about two drams of the silver bath are sufficient for a 12 in. by 10 in. piece of paper. But in avoiding the Scylla of insufficient silver solution, I made the acquaintance of a Charybdis of too much silver; and as it was some time before I thoroughly found out the cause of the phenomenon, I will give it here for the benefit of any future Ulysses.

During the past summer I made one batch of paper that, when printed, showed patches, or, in some cases, the whole surface covered with a curious frothy cobweb of white insoluble matter, something like the mould on damp leather. The image, too, was weak and sunk in, wanting in contrast. My first thought was, of course, insufficiency of silver, and I added more, and allowed the paper to lie flat and imbibe plenty of solution before hanging up to dry. But this rather made matters worse, and I then ascribed it to the formation of carbonate of silver, an insensitive white salt due to an excess of carbonate in the salting solution; but paper salted with the simple chloride also gave it, but in a less degree. I then came across an old piece of paper that had been soaked in the salting solution, and this printed out at once free from the defect. This gave me the clue at once, for I saw that it was not want of silver, but rather excess of silver, that caused the appearance, and I tried coating a sheet unequally, leaving a pool to soak in the middle. As I surmised, the position of this pool was at once marked by the insensitive, crape-like markings. I must confess that chemically I am still unable to account for the appearance. Citrate of silver, which it naturally should be, is a soluble and sensitive salt, and I can only imagine it to be similar in composition to the white flaky scales that are generally gradually deposited when citric acid is added to silver. It may, of course, be due to impurities, and I should think a careful examination of it would interest some of our chemists.

Therefore, whilst using plenty of silver, do not use too much, and do not allow the paper to lie flat after coating; but directly the surface is seen to be equally covered with the solution, hang it up to dry by one corner, and allow the excess to drip off.

If the paper be properly and sufficiently salted, the above phenomenon is not, I think, likely to happen, for I clearly traced out in the above case that my paper had been, in the first case, salted on a weak bath, and in the second not floated sufficiently long.

I now come to the second half of my paper, that reserved for the intensification process, an outline of which I gave in my last lecture. I call it an intensification process advisedly, for it differs in its action considerably from several developing processes with which, at first sight, it may appear to have some similarity.

In all the developing processes, an image that is invisible, or nearly so, is developed out, but in this process the image is printed out to almost any point short of complete density, and is then intensified up to the required point, exactly as one would treat a gelatine negative. Like a negative, also, the clear shadows, or, what corresponds to them, the high-lights, remain unchanged, no invisible image being brought to light, whilst the heavy deposit is still further increased; and in both processes there is a tendency to harden the result, so that good results can be obtained from thinnish negatives. There is not the slightest need that any density be shown on the print, as the feeblest indications of light action can easily be intensified up to the most pitchy blackness, or it can be stopped short at any desired condition, and then toned and treated exactly as if it had been printed out in the frame in the ordinary way.

---

A magnificent microscope has just been completed by the Munich Poeller Physical and Optical Institute for the great Chicago Exposition, at a cost of $8,750. It possesses a magnifying power of 11,000 diameters. As might be expected, electricity plays an important part in the working of this gigantic instrument, which, after inspection by American citizens, is expected to give an impetus to the Munich mart for scientific apparatus. The electricity furnishes and regulates the source of light, which, placed in the focus of a parabolic aluminium reflector, reaches an intensity of 11,000 candle power. The electricity also provides the means of an ingenious automatic mechanism for the centreing of the quadruple condensers and illuminating the lenses. There is an arrangement for the exact control of the distance of the carbon point. The most important novel feature is the cooling machine, which is indispensable on account of the extreme heat generated by the intense illuminating arrangement. A machine, regulated by a Helmholtz electric centrifugal regulator, provides the several microscopic and polariscopic systems of the apparatus with a fine spray of fluid carbonic acid, which, immediately after its release from the copper vessel, in which it is held under a pressure of twenty-three atmospheres, becomes converted into gaseous matter, so intensely cold that only ·00007 gramme of carbonic acid per second is required to give the result. The magnifying power of the apparatus with ordinary objectives, as has been stated, is about 11,000 diameters, but with oil immersion lenses it can be increased to 16,000.

## Notes.

We are not aware of the precise number of inches of rain above the average which have fallen in Great Britain during the present year, but we feel certain that it must be something considerable, and its effect upon the work of the photographer generally has been most disheartening. It is all very well to use artificial light in the studio, and to advertise that you are quite independent of dull weather. Your clients may possibly believe that you are speaking the truth, but they won't come out in the rain. Dress is, unfortunately, such a very important part of most people's pictures, and the rain is so apt to injure it, that the visit to the studio is put off until Jupiter Pluvius turns his head the other way.

It is positively aggravating to the half-drowned photographer here at home to read of the rain-making experiments in Texas. There seems, by the way, to be a good deal of quackery about these same experiments. It is said that, by exploding charges of dynamite in the air, rain is caused to fall in copious showers; but it is very certain that no amount of dynamite will bring down rain unless it is already on tap, as it were. A concussion of the air may possibly shake it down, but the chances are that by waiting a little longer it would tumble off its perch of its own accord. For the benefit of photographers, if not of the community at large, we wish that someone in this country would initiate a series of *fine weather* experiments. One of these might consist in causing explosions in the air while rain was actually falling, in the hope that it might be encouraged to come down a little faster, and give the sun a chance of appearing to a world which has almost forgotten his existence.

We understand that the work of photographing the immense stretch of the Pennsylvania Railway proceeds with as much celerity as possible, and that already about four hundred negatives have been taken. The pictures obtained are rather to be described as views from the railroad than of it, and, as this road traverses some of the grandest scenery which can be imagined, the collection of negatives, each measuring 18 by 22, will be as valuable as it is unique. A panoramic camera is also brought into use as occasion may require, and this instrument produces a film negative measuring 18 by 42 inches. Our own railway companies are by no means neglectful of the advantages to be gleaned by exhibiting in their carriages photographs of the most picturesque spots on their lines, although they do not attempt anything on the grand scale adopted by the Pennsylvania people. Most of the leading lines also employ a photographer to make pictures of completed structures, such as bridges, and other works in progress.

Certain samples of gelatino-chloride paper which we have lately been testing exhibit a fault which manufacturers would do well to guard against if they hope to oust albumenised paper from its—at present—secure position. The film is so excessively tender, even after the operator has done his best to harden it, that abrasion is likely to occur by the slightest touch. It is a provoking thing, after going through the tedious operations of exposure—and exposure is especially tedious in October—toning, fixing, and washing, to find that a print or two must be rejected because of mechanical injury. But, even should the print reach the drying stage, it has yet to pass the ordeal of mounting, and the mounter who is accustomed to albumen prints is apt to think that the new paper will stand the same handling with impunity, until he finds out his mistake.

The German Emperor is certainly one of the most inconsiderate of men. He first plunges all the photographic dealers into despair by growing a beard, and, just when they are reconciled to the change, and are anticipating a large sale from his new portraits, His Majesty disappoints them by another "quick change," and presto! he goes back into his former beardless condition. Of course, those dealers who happen to have a stock of old photographs will rejoice; but even they would prefer a notability to make up his mind as to how he should look, and stick to it. Lord Randolph Churchill is said to have cost a Regent Street photographer some hundreds of pounds by growing his beard, so that the matter is really a very serious one.

The photographer is not the only one who suffers from the vagaries of celebrities. The cartoonist and caricaturist are in exactly the same plight. So far as Lord Randolph Churchill is concerned, they have mastered his new appearance sufficiently well for their purposes; but who is to guarantee the continuance of any man's beard? The late Mr. Parnell was a great offender in this respect, for about every six months he altered his facial appearance.

There are signs that the taste for etchings is not so keen as it was two or three years ago. Whether the public have become alive to the fact that so-called artists proofs, for which high prices are demanded, are in many instances no better than ordinary proofs, and, consequently, have come to look upon etchings with mistrust, we cannot say. This reason has been put forward; but we are inclined to think there is not so much in it as in the fact that etchings have been "fashionable," and, like other things, have to suffer fashion's vicissitudes. Line engravings have long lost the favour of the public, and it looks as if photogravure will creep into its place. Autotype and platinotype pictures have also a future before them, but they are as yet *caviare* to the multitude.

A curious example of the disadvantageous use of photography is to be seen in the November issue of the *Magazine of Art*. A reproduction from a photograph of the statue of Lord Napier of Magdala, recently put up in Waterloo Place, shows that the camera has been placed in such a position as to give a very disagreeable view of the statue in question. It would appear as if the exigencies imposed by the required size of the picture had trammelled the photographer, and that he was compelled to take the photograph from a point which the eye would reject. In other words, the camera has been placed far too near, and the result is, the front portion of the horse is absurdly exaggerated, the outstretched neck bringing the head to a level with the head of the rider. The fore legs, on the other hand, are made to appear very short, and a singularly distorted quadruped is the result. As for Lord Magdala, the spectator is made to look underneath his nose, always an unpleasant aspect. A statue at a considerable elevation is a subject best left alone by the camera, unless the latter can be sufficiently elevated, or the size of the picture be no object.

## IN THE LAW COURTS.

BY C. FLEETWOOD PRITCHARD.

*The London Printing and Publishing Alliance, Limited, and Keep and Co.*, v. *Horace Cox.*

This case, which is a very instructive one in the law of copyright, came before the Court of Appeal towards the end of last term. The action was brought by the London Printing and Publishing Alliance, the proprietors of *Myra's Journal*, and Messrs. Keep and Co., against Mr. Horace Cox, the publisher of the *Queen*, for an infringement of their copyright in a picture entitled "On the Threshold." It appears, from the report in the *Times*, that on the 9th of April, 1890, Mrs. Earnshaw—the painter of the picture—wrote to the art critic of the *Queen*, enclosing a photograph, and suggesting that it should be published in that paper in black-and-white. In the meantime she was also in negotiation with Messrs. Keep and Co. for the sale of the copyright of the picture in colour to them, and ultimately the picture and the entire copyright were bought by Messrs. Keep. While these negotiations were in progress, Messrs. Keep were arranging for the production of the picture in the Christmas number of *Myra's Journal*, and when the purchase from Mrs. Earnshaw had been completed, they entered into an agreement with the proprietors of that paper by which the latter agreed to purchase the picture and the copyright, and at the same time gave Messrs. Keep an order for 55,000 copies to be ready in time for their Christmas number. Messrs. Keep and Co. had duly registered themselves at Stationers' Hall as owners of the copyright, but the London Printing and Publishing Alliance were not registered.

In August, 1890, Mr. Cox, apparently relying upon Mrs. Earnshaw's letter of the 9th of April, published a sketch of the picture in the *Queen*, and this was the infringement of which the plaintiffs complained. The case first came on before Mr. Justice Vaughan Williams on the 13th of May last, and he gave judgment in favour of the plaintiffs. Mr. Cox, however, appealed to the Court of Appeal, who decided that he had infringed the plaintiff's copyright, because Mrs. Earnshaw's letter was not a license to publish the picture without further consent from her. Lord Justice Lopes said—and the other two judges agreed with him—that the letter was not distinct enough to amount to a license; "it was the commencement of a negotiation, not a definite license, and still less a concluded agreement." The Court further decided, however, that neither of the plaintiffs had any right of action against Mr. Cox for this infringement—Messrs. Keep because they had sold their copyright in the picture to the London Printing and Publishing Alliance, and the latter because they had not been registered as owners of the copyright at Stationers' Hall. So the Court gave judgment for the defendant, who thereby escaped the penalties of his wrong-doing solely through a technical mistake on the part of the plaintiffs.

The case shows, first, how important it is that the owner of the copyright in a picture should be registered as such at Stationers' Hall (for through their omission to do this, the plaintiff Company not only failed to recover the penalties for which they sued, but they also had to pay a large sum towards the defendant's costs); and secondly, that a license to reproduce a picture, in order to be of any value, must be explicit in its terms. It also appears doubtful whether, even supposing Mrs. Earnshaw's letter had amounted to a license, that would have been sufficient to have protected Mr. Cox if the owners of the copyright had been duly registered, for the picture was published in the *Queen* after the copyright had been disposed of by her to Messrs. Keep, and, therefore, when her license was no longer of any value. This point, however, was not considered by the Court of Appeal.

## PARAMIDOPHENOL.

A writer in the *Photographic Times* recently described some experiments with this new developer, which fully bear out the advantages claimed for it by its original investigators, MM. Lumière Brothers. He describes the substance as being a chocolate-brown, coarse, crystalline powder, with a solubility akin to that of eikonogen. The developer used was made up as follows:—

| | |
|---|---|
| Water ... ... ... ... ... | 800 parts |
| Potassic carb. ... ... ... ... | 40 ,, |
| Sodium sulphite (cryst.) ... ... ... | 100 ,, |
| Paramidophenol ... ... ... ... | 8 ,, |

Three plates, exposed under like circumstances, were developed:—(1) With paramidophenol; (2) with the standard eikonogen in one solution; (3) with S. P. C. hydrochinon.

The first plate developed rapidly, and much in advance of Nos. 2 and 3, built up intensity uniformly and in proportion with the progress of the process, the non-exposed portions remained clear glass, and all middle tints were brought out to perfection. It took about four minutes to develop a good negative.

On the second plate the image developed rapidly, but it took a little over ten minutes to gain the intensity of No. 1. After fixing, there were distinct indications of yellowing on edges and corners.

To gain the same intensity in No. 3 as in Nos. 1 and 2, development was prolonged to twelve minutes and thirty seconds. There was a distinct want of middle tint, the negative being of harsh character. After fixing, the plate showed a slight yellow veil all over.

After an interval of one hour, three other plates were developed with the paramidophenol solution first used, with like results.

What has been reported of paramidophenol by Messrs. Lumière and Dr. Andresen seems to be thoroughly verified by our first experiments. It is as energetic a developer as any other substance previously used, and it has the property of producing glass-clear and transparent negatives, and without a tinge of yellowing, even after the developer has been repeatedly used.

An objection to paramidophenol is its present high price, though this is not so apparent when we consider the large number of plates which may be developed with the same solution. Experience has shown that the greater the demand for an article, the more will its price be reduced.

The Photographic Club.—November 4th, annual general meeting; November 11th, "Impurities in Photographic Chemicals," Mr. A. M. Levy.

Hackney Photographic Exhibition Awards.—*Class A* (Members)—silver medals: Messrs. Barton, Sinclair, Hensler, Beckett; championship gold medal: Mr. Arthur Barker. *Class B*—gold medal: Augustus W. Wilson; silver: W. Wesson; bronze: S. H. Barton. *Class C*—silver: W. L. Barker; bronze: W. Fenton Jones. *Stereoscopic Class*—W. Taverner (prize—a pair of lenses presented by Mr. H. Crouch). *Members' Lantern Slides*—silver: Mr. Taverner; bronze: Mr. Dando. *Open Lantern Class*—silver: W. Taverner; bronze: J. E. Austin.

## ON THE INTENSIFICATION AND REDUCTION OF GELATINE NEGATIVES.*

BY ROLAND WHITING.

Before I leave this portion of my paper, there is just one more formula I should like to bring before those who might care to experiment in this direction. It looks like a very good one, but I cannot say what its qualities are, as I have not tried it. It was published in the *Photographic Review* of December 14th, 1889, and is known as Karsebaum's intensifier. I repeat it word for word from that journal :—"The plate is soaked for some minutes in a solution of citric acid, say one part in twenty of water, after which the following solution is poured on :—(A) Hydroquinone, 6 grammes (about 92 grains) ; water, 700 cubic cents. (about 24½ fluid drams) ; nitric acid, 10 drops. (B) Silver nitrate, 8 grammes (about 123 grains) ; water, 100 grammes (about 3½ fluid ounces). Forty volumes of A are mixed with one of B. The action of this intensifier is slow, but very satisfactory. A second fixing is desirable, so as to remove all traces of undecomposed nitrate.

We have now to consider the second class of intensifiers, which are those whose action is due to chemical change, and which contain the forms of intensifiers most in use, namely, the mercuric intensifiers ; but, before I go on to these, there are two which I should like to mention, chiefly on account of the novelty of the colour they render the negative. The first of these is Mr. Selle's method with uranium nitrate. The formula is as follows :—

| | |
|---|---|
| Uranium nitrate ... ... ... ... | 2 drams |
| Potassium ferridcyanide ... ... ... | 2 ,, |
| Water ... ... ... ... ... | ½ pint |

This must be filtered. The plate, after being well washed, is placed in this solution, which acts by turning the film red, at the same time strengthening the strong portions to a very great degree. This is a very good intensifier if very great density is required, but you must be certain there is not the slightest trace of hypo in the film, otherwise a precipitate will settle itself all over the film. The chemical change which takes place in this case is: the silver which constitutes the image reduces the potassium ferridcyanide to ferrous cyanide, which, combining with the uranium, forms an insoluble double cyanide, which is precipitated on the image. Hypo also converts the ferric to the ferrous salts, so if hypo is present in the film a precipitate is deposited all over the negative.

Mr. Carey Lea's is the other method which gives a bright red negative. This is as follows :—The plate is first immersed in a sherry-coloured solution of iodine until it has changed its silver to silver iodine ; it is then placed in a solution of—

| | |
|---|---|
| Schlippe's salts ... ... ... ... | ½ ounce |
| Water ... ... ... ... ... | 1 pint |

which converts it to a bright red colour. Schlippe's salts is a double sulphide of sodium and antimony. The silver iodide combines with this and forms a double sulphide of silver and antimony, the sodium, which was displaced by the silver, combining with the iodine and forming sodium iodide. If a very dense negative is required, the plate is left in the iodine until all the silver is converted to iodide. This solution of Schlippe's salts does not keep ; therefore it must be made up as required.

Of the mercury intensifiers there are many formulæ, although very few operators seem to act in strict accordance with them. Perhaps the simplest is that known as Dr. Eder's formula. For this the following solutions are required :—

*No. 1.*

| | |
|---|---|
| Mercuric chloride ... ... ... ... | ¼ ounce |
| Water ... ... ... ... ... | 1 pint |

*No. 2.*

| | |
|---|---|
| Ammonia (·880) ... ... ... ... | 2 ounces |
| Water ... ... ... ... ... | 1 pint |

*No. 3.*

| | |
|---|---|
| Potassium iodide ... ... ... ... | 1 ounce |
| Water ... ... ... ... ... | 1 pint |

To intensify with this, the plate must first be placed in No. 1 until the mercury has whitened it, in most cases, right through. Then the plate is washed for a short time, after which it is placed in the ammonia solution till it is blackened through to the back of the plate, and it is then finally washed. If, however, a greater amount of density is required than this gives, the plate must be placed in the iodide solution. This is done after the plate has been treated with the mercury and washed, and before treating with the ammonia, and the plate must be washed after the application of the iodide. After this treatment it is sometimes found to be too dense. If such is the case, it can be again reduced by placing it in a solution of hypo of about ½ ounce to the pint.

Dr. Eder is also, I believe, the author of the following formula, which is, perhaps, an improvement on the last. After the negative has been bleached with the mercury, it is thoroughly washed and treated with this solution :—

| | |
|---|---|
| Potassium cyanide ... ... ... | 10 parts |
| Potassium iodide ... ... ... | 5 ,, |
| Mercuric chloride ... ... ... | 5 ,, |
| Water ... ... ... ... ... | 2,000 ,, |

This causes the film to become dark brown, and, if it should give too great density, it need only be left in this solution for a little longer, when it will gradually reduce again. This is certainly very simple, but it is evident, as the solution reduces after the maximum density is obtained, the negative under treatment must be closely watched.

A slightly different kind of mercuric iodide intensifier is that recommended by Mr. Edwards. Three solutions are made up as follows—

*No. 1.*

| | |
|---|---|
| Mercuric chloride ... ... ... ... | 60 grains |
| Water ... ... ... ... ... | 1 ounce |

*No. 2.*

| | |
|---|---|
| Potassium iodide ... ... ... ... | 90 grains |
| Water ... ... ... ... ... | 2 ounces |

These two solutions are added, when mercuric iodide is formed as a red precipitate. To this another solution is added, consisting of—

| | |
|---|---|
| Hypo ... ... ... ... ... | 120 grains |
| Water ... ... ... ... ... | 2 ounces |

which dissolves the precipitate. The plate is merely placed in this until density is obtained, which takes place very quickly. For this reason I prefer to use more hypo than here given, as the strengthening action takes place more slowly, and the plate is thus more under command. This is a very simple intensifier to use, and has, moreover, the advantage that the plate need not be very thoroughly washed after being fixed ; but in my hands it has not been very successful, as I have never been able to prevent it clogging up the shadows.

About the best intensifier for general use is the one which Captain Abney has recommended some time back,

* Concluded from page 735.

and which, I think, is a slight modification of Dr. Monckhoven's method. The following are solutions required :—

*No.* 1.

| | |
|---|---|
| Mercuric chloride ... ... ... | 100 grains |
| Potassium bromide ... ... ... | 100 ,, |
| Water ... ... ... ... ... | 10 ounces |

*No.* 2.

| | |
|---|---|
| Silver nitrate ... ... ... ... | 100 grains |
| Water ... ... ... ... ... | 10 ounces |

To this last is added a solution of potassium cyanide, which produces a precipitate. The cyanide must be added gradually little by little and with agitation. After a time the precipitate will redissolve, and the cyanide must be added until only a very little of it is left undissolved. The strength of the cyanide recommended by Captain Abney is 100 grains to the ounce of water. After the plate has been thoroughly freed from the fixing agent, it is bleached in the mercury solution, aud, after washing, is placed in the silver solution until it is blackened right through. Captain Abney says this is the best and most permanent intensifier he has ever used, and considers it to supersede all others. Certainly, if a clear and vigorous negative is required, it is, without doubt, a splendid one to use. However, where permanency is required, all mercuric intensifiers should be used with caution, as compounds in which mercury forms a part are looked upon by most experimenters as unstable substances.

I will now go on to describe a method of treating negatives that require strengthening, which I have used very successfully indeed for a long time, and one which is a good advance towards the ideal. This method is not entirely my own; it was, to a great extent, published in one of the photographic papers a long time past, but, as it does not seem to have attracted the attention of many photographers, it will no doubt be new to some of you. It is tolerably well-kuown that, if a negative is first whitened with mercuric chloride, and then blackened with ammonia, the density is considerably greater than if it had been blackened with sodic sulphite. Now, as ammonia and sodic sulphite can be used at the same time, or one after the other upon a plate, without any harm coming to it, I take advantage of the different strengthening power of the two chemicals in the following manner. Supposing I have a negative which I desire to strengthen more in the half-tones than I do in the high-lights, I proceed as follows. The plate is laid face downwards in a dish, the ends being supported on a couple of pieces of match, so that the face of the plate does not touch the bottom of the dish. The mercuric chloride is then poured in and allowed to cover the plate. The plate must now be watched closely, and, as soon as it is whitened through until all but the highest lights are changed, it must be taken out and immediately washed. When sufficiently washed, it is placed face downwards, as before, in a rather weak solution of ammonia until the half-tones only have blackened through, when it is again placed under the tap for a few seconds just to stop the action of the ammonia going auy further. After this has been done, it is finished by placing it in a solution of sodic sulphite about a quarter the strength of a saturated solution, until the high-lights are blackened through. It is then washed as usual. It will be obvious to all of you that this method gives to the half-tones a greater proportion of strength than it does to the high-lights, especially if the bleaching process has not proceeded too far. This method is equally applicable to a negative which requires a greater proportion of strength in the high-lights as in the case of an over-exposed negative. The negative is bleached entirely through, including the highest lights. Then, after washing, it is placed in a solution of sodic sulphite until the half-tones only are blackened through, after which it is finally immersed iu a rather strong ammonia solution until the blackening is complete. Thus, it will be seen that not only can either the high-lights or the half-tones be strengthened as required, but, by varying the length of time of immersion in either solution, and by varying the amount of bleaching, almost any result can be obtained.

I must draw my paper to a close without speaking of the chemical changes which take place in all these operations, neither can I speak on the third method of strengthening negatives, viz., the powder process, although much use can be made of this process in the artistic treatment of negatives; but must content myself with the hope that some may have learnt something from what I have already said, or that fresh ideas may present themselves.

## PHOTOGRAPHY AT THE WORLD'S FAIR.

Our American cousins are exercising their minds as to the rules and regulations which will be framed at Chicago for the government of camera-bearers. Says the *Beacon:*—

"Photographers, through their various organisations, are preparing to press on the executive of the Columbian Exposition the necessity for a special departmeut, or otherwise a full recognition of photography in the great show. It is no doubt of great importance that every facility should be given, and every inducement held out to make it the greatest and most truly representative of the best results of the art from all over the world, but it is not less important that measures should be taken to prevent the management from trying to make up for its extravagance in paying absurdly large salaries to itself by taxing not only American citizens who have, by their guarantee, made the Exhibition possible, but also the strangers whom it is trying to allure within its gates, or, at least, those of us and them who happen to be accompaoied by their hand-cameras. That our Gallic neighbours did so is no reasou why we should follow the bad example, and, if our 'liberty' is more than a mere name, we will not submit to the imposition.

"It would not, of course, be convenient, and therefore not advisable, to give permission to employ cameras on tripods in such crowded places, but there cannot, and should not, be any objection to the free use of hand or detective cameras."

Pretty Miss Armytage Moore is the subject of *Piccadilly's* portrait this week. Owing to the fact that the lady is looking into a mirror placed at her side, there are, to all intents and purposes, two Miss Armytage Moores represented in the picture. As *Piccadilly* jokingly remarks: "Of vigorous intellect, Miss Moore might most properly obtain large damages from Mr. Bassano for a portrait which proclaims her beside herself."

It is said that, during his passage from America, Prince George of Greece had a very unpleasant time of it. There were over one hundred and fifty American young ladies on board, and their attentions to the Prince became annoying and oppressive. Nearly all the ladies had cameras for taking instantaneous photographs, and every time that the Prince appeared on deck over one hundred cameras were levelled at him. Latterly, the Prince held his hands to his face when he came on deck, but even this was no protection from the snaps of the instantaneous photograph. During the latter part of the voyage he remained below. Even Royalties do not want to be always on view.

## COPYING LINE ENGRAVINGS.

There are hundreds of operators who can take a good portrait, and who can be trusted to make a good landscape negative, but if they are required to make a copy of an engraving or line drawing, they fail. The negative is generally so thin that it will not yield a decent print, and, as such negatives are generally required for process work, they should be positively black and white. In other words, the lines should be as clear glass on a dense black background.

Mr. John Carbutt, the eminent plate-maker, has recently published in the *Photographic Times* the method which he adopts in the production of such negatives, and from his article we have taken the following abstract.

The engraving or letter-press to be photographed should be placed so as to receive an even-diffused light, not to use a smaller stop than will give good definition, and expose for the whites, not too short, or it will be difficult to obtain density. I recommend carbonate of soda as the alkali, as in the following formulas, with sodium sulphite and potassium bromide, and pyrogallic acid added dry. With these I find it more certain to produce density and clearness of lines on my "A" or "B 12" process plates, than with a developer containing the caustic alkalis. I also give a formula for clearing the lines when necessary, and recommend as a suitable intensifier bichloride of mercury, followed, after well washing, with cyanide of silver.

The formulas are as follows:—

Alkali Solution.

| | |
|---|---|
| Water ... ... ... ... ... | 60 ounces |
| Carbonate of soda (crystals) ... ... | 2 ,, |
| Sulphite of soda (crystals) ... ... | 4 ,, |
| Bromide of soda or potass. ... ... | 60 grains |

Developer.

| | |
|---|---|
| Alkali solutiou ... ... ... ... | 3 ounces |
| Dry pyrogallic acid ... ... | 8 to 10 grains |

Mix and dissolve before flowing over the exposed plate. Instead of weighing the pyro, a very close approximation to the weight may be got by taking a boxwood mustard spoon that will hold three to five grains of pyro, and measure the quantity required.

Acid Fixing and Clearing Bath.

| | |
|---|---|
| Warm water ... ... ... ... | 64 ounces |
| Hyposulphite of soda ... ... ... | 16 ,, |
| Sulphite of soda... ... ... ... | 2 ,, |
| Sulphuric acid ... ... ... ... | 1 drachm |
| Chrome alum ... ... ... ... | 1 ounce |

Dissolve the sulphite of soda in eight ounces of the water. Mix the sulphuric acid with two ounces of the water, and add slowly to the solution of soda sulphite; dissolve the chrome alum in eight ounces of the water, the hyposulphite of soda in the remainder; then add the sulphite solution, and last the chrome alum. This fixing bath will not discolour until after long usage, and both clears up the shadows of the negative and hardens the film at the same time.

Let remain two or three minutes after the negative is cleared of all appearance of silver bromide. Then wash in running water for not less than half-an-hour to free from any trace of hypo solution. If no intensification or clearing is required, swab the surface with a wad of wet cotton, rinse, and place in rack to dry spontaneously.

Clearing Solution

With which to clear away any slight deposit in the lines or clear parts of a negative.

| | |
|---|---|
| Water ... ... ... ... ... | 8 ounces |
| Cyanide of potass. (pure) ... ... | 60 grains |
| Iodine (dissolved ¼ ounce alcohol) ... | 10 ounces |

Intensifying Solution.

No. 1.

| | |
|---|---|
| Bichloride of mercury ... ... ... | 240 grains |
| Chloride of ammonia ... ... ... | 240 ,, |
| Distilled water ... ... ... ... | 20 ounces |

No. 2.

| | |
|---|---|
| Chloride of ammonia ... ... ... | 240 grains |
| Water ... ... ... ... ... | 20 ounces |

No. 3.—Cyanide-Silver Solution.

| | |
|---|---|
| Distilled water ... ... ... ... | 6 ounces |
| Cyanide of potass. (C. P.) ... ... | 60 grains |
| Distilled water ... ... ... ... | 2 ounces |
| Nitrate of silver ... ... ... ... | 60 grains |

Pour the silver into the cyanide solutiou while stirring, and mark the bottle *poison*.

Let the plate be intensified, wash for at least half-an-hour, then lay in a five per cent. solution of alum for ten minutes, and again wash thoroughly; this is to ensure the perfect elimination of the hypo. The least trace of yellowness after intensifying shows that the washing was not sufficient.

Flow sufficient of No. 1 over the negative to cover it, and allow to either partially or entirely whiten; *the longer it is allowed to act*, the *more intense* will be the result. Pour off into the sink, then flow over No. 2, and allow to act one minute; wash off, and pour over or immerse in No. 3 until changed entirely to a dark brown or black. No. 3 can be returned to its bottle, but Nos. 1 and 2 had better be thrown away. Wash thoroughly and dry.

I have found it very convenient in being able to produce, on transparent films coated with "A" emulsion, various sizes of negatives and positives from type-matter for my advertising blocks, the photo-engraver using them reversed for zinc etching, the thinness of the film allowing perfectly sharp reversed impressions to be made on the zinc by placing the printing frame in a box about twenty inches deep, so as to cut off all but vertical rays.

---

London and Provincial Photographic Association.—Subject for Nov. 5th, "Development of Lantern Plates"; Nov. 12th, "Cau Halatiou be avoided by Staining the Film in any way?"; Nov. 19th, lantern night—visitors invited.

Sitting for Portraits.—The misery of sitting for one's portrait has been described in graphic fashion; not so the misery of the portrait painter. Professor Herkomer, who speaks with authority, has come forward to supply the omission. Submitting the finished work to the family is a trial. Of course nearly every one of the circle had been expecting something different. On one such occasion a lady sitter said to him, "This is an awful moment for both of us." During that critical examination the painter walked about his studio and tidied up the whole place. Sometimes the sitter's wife will say, "Just stand next it, dear." Here Professor Herkomer is of opinion that the artist should turn round and put his foot down, because a picture ought to look right or not right. After awhile, if he is fortunate, somebody will say she "likes it," and then, but not earlier, the painter should cease from tidying his room. A lady once said to Professor Herkomer, "Do you flatter?" He answered, "No." "Then," she replied, "I must go somewhere else." It is satisfactory to learn on such good authority that photography has not injuriously affected portrait painting in any way. There are, in Mr. Herkomer's opinion, more portraits painted now than at any other time in the world's history, and it is his belief that the best are done in England.—*Daily News.*

## THE CHICAGO EXHIBITION, 1893.

The council of the Society for the Encouragement of Arts, Manufactures, and Commerce, have issued a Prospectus, from which the following are extracts :—

Under the date of the 27th August, 1891, Her Majesty was pleased to issue a commission to the Council of the Society of Arts, authorising them to act as commissioners for the Universal Exhibition, which, pursuant to an Act of Congress, and in accordance with a proclamation made by the President of the United States of America, will be held at Chicago from May 1st to October 30th, 1893.

The Royal commission are now prepared to receive applications from artists, manufacturers, and others desirous of taking part in the Exhibition, to afford them all necessary information, and to offer them all available facilities which they may desire for this purpose. Such applications must be made upon forms to be obtained from the secretary of the commission at their offices, Society of Arts, John Street, Adelphi, London, W.C. They must be sent in properly filled up not later than February 29th, 1892, and addressed to the secretary as above.

As the funds granted by H. M. Government will not suffice to defray all the expenses of the section, it is necessary that they should be supplemented by payment from the exhibitors. A charge will therefore be made to each exhibitor, based on the amount of space occupied, and calculated on the following scale :—

| | s. | d. | |
|---|---|---|---|
| For spaces not exceeding 100 sq. ft. ... ... ... ... | 5 | 0 | per sq. ft. |
| " exceeding 100 sq. ft and not exceeding 200 sq. ft. | 4 | 6 | " |
| " " 200 " " " 300 " | 4 | 0 | " |
| " " 300 " " " 500 " | 3 | 6 | " |
| " " 500 " " " 750 " | 3 | 0 | " |
| " " 750 " and upwards ... ... ... | 2 | 6 | " |

The minimum charge will be £5.

Exhibitors' goods will be transmitted direct in bond to Chicago, where the usual Customs examination will be made. Goods for exhibition only will not be liable to duty, but on goods sold the usual rates will have to be paid. Goods can be sold in bond at prices independent of the tariff, the duties being payable by the purchaser.

The American railroad companies propose to carry goods back from the Exhibition free, charging the usual rates for the outgoing journey. These rates, it may be noted, are low in comparison with those usual in European countries. Full information as to routes, traffic, rates, &c., will be provided in due course.

A general official catalogue will be published in English, French, German, and Spanish. A special catalogue will also be published for the British section.

The general reception of articles at the Exhibition buildings will commence on November 1st, 1892, and no articles will be admitted after April 10th, 1893.

Photography is classed, in Group 147, with Instruments of Precision, Experiment, and Research, under Department L—Liberal Arts, Education, Literature, Engineering, Public Works, Music, and the Drama.

## REVERSED NEGATIVES BY STRIPPING.

BY A. H. CALDERWOOD.

Since the introduction of photography into the making of plates for the type-press, and thus the necessity of reversed negatives, much has been written on how best to secure these. Some advocate the use of a prism before the lens to be the only way; others hold a mirror to be equally efficient; while some say they can be made by placing the glass side of the sensitive plate nearest the lens, and so receiving the image through the glass. Each have their drawbacks, one being expensive, the other troublesome to keep in order, and the third uncertain.

I am using the method of stripping the films from the one plate, and reversing or turning them on another, cleaned and ready to receive the same. I have stripped a great many in this way, and have not had a single failure, and in the end requiring no more time than the other processes, owing to the shorter length of exposure necessary as against the use of the prism or mirror. Another point in its favour is, that a number of small negatives may be placed together on one plate, and the printing and etching done in one operation.

There are three solutions required, viz.: The rubber solution, which can be purchased ready for use, or made by dissolving a piece of Para or other gum in benzene; plain collodion, rather thin; and a solution of acetic acid and water 1 to 5.

The negative is made in the usual way, preferably on a plate much larger than the copied drawing will be, intensified with mercury or copper sulphite, and allowed to dry. It is then coated with the rubber solution (draining the surplus back into the bottle), placed on a slab or table, and allowed to dry. It is then coated with the collodion. Now, with a knife, or some sharp instrument, cut through the film, leaving a margin of an inch around the picture. It is then placed in a bath containing the acidified water, where it remains for a few minutes. Another water bath, containing the clean plate which is to receive the film, is now got ready. The plate to be stripped is removed from the acid solution, washed gently under the tap, when, by trying the edges, it will be seen whether the film is ready to strip easily. If not, it must be replaced in the acid. When the edge of the film leaves the plate easily, then lay the plate down, elevate one end of the bath, and, starting at one corner, gradually lift the film from its support until the other corner can be grasped and the film entirely removed. Then place in the dish containing the plate to receive it—face down, of course. Then, by lifting the plate from the water, and with it the film, it will be found to cling to it, and to be quite free from air-bells or particles of dirt. Should the air-bells appear, they can be rubbed out with a piece of soft cotton or a squeegee, interposing a piece of clean absorbent paper. As before stated, negatives made in this way are absolutely sharp, whereas, when made through the glass, the thickness of the same has to be guessed at, and the camera focussed back this distance—a rather crude method where absolute sharpness of lines is a *sine quâ non*.—*Wilson's Photographic Magazine.*

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. & R. Haddon), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Specifications Published.

18,120. *Nov. 11th*, 1890.—"Lantern Microscopes." R. G. Mason, 24, Clapham Park Road, Clapham, S.W.

At the under side of the stage plate are fixed, by screws or other means, two dovetail pieces of brass or other metal to form guides. Two dovetail plates are arranged to fit firmly into said guides, one of said plates having fixed to it the tube containing the optical system of lenses, for use with the magic lantern or projective form of instrument; the other plate has fixed to it the half of an ordinary joint used to incline microscopes at any angle. A stop on the main plate prevents the plates from sliding right through, so that the two dovetailed plates are exactly central to the optical axis of the instrument when pushed in under the stage plate. The plate carrying the system of lenses has a screw at the end of the outer tube for screwing into the front of a magic lantern.

On the upper side of the stage plate is fixed a limb carrying the fine and coarse adjustments. On the slide of the coarse adjustment is fixed a tube, on which is a smaller tube carrying the "objective." The main stage plate being removable from the smaller plates, enables the sub-condenser lenses to be easily changed if circumstances require.

12,218. *July 18th*, 1891.—"Detective Cameras." Newnham Browne. (F. A. Fichtner, 6, Elisenstrasse, Dresden, Germany.)

In order to change the plates, *i.e.*, to lift out the foremost plate which has been exposed, aud trausport it to the back, uuder the bottom of the camera there is provided a flexible slide, the front of which is turned upwards towards interior of the camera, being flush with the internal surface of the bottom. Two fingers on the slide engage the foremost plate, which is pushed out through a slot in top of camera into a changing bag at the top of same.

The controlling or indicating device consists of two ratchet wheels, which have as many teeth as there are plates in the magazine. The spindles of these two wheels pass through the sides of the camera, and have on their outer ends a pointer workiug over a dial. One of the ratchet wheels is worked by a lever and pawl, and the other by a sliding pin and pawl. The end of the lever projects into a groove, being correspondingly inclined to the movement of the slide. The end of the pin rests on the slide, and is bevelled towards the front of the latter. On moving the slide forward, for changing the plate, it comes in contact with the lever, and, acting ou the incline of the same, causes it to oscillate ; the pawl then acts on the first wheel and rotates it one tooth, thereby displacing the indicator to the amount of one figure, thus showing that the first plate has been changed.

To enable an iris diaphragm inside the camera to be worked from the outside, a portion of the periphery of a sliding ring outside the lens mountiug is provided with teeth ; a toothed segment gears with these teeth. The width of the teeth on the segment allows for the displacement of the leus in focussing, without causing the teeth on the ring to go out of gear. The toothed segment works on a spindle, one end of which projects outside the camera, and is provided with a knob by which it can be rotated so as to work the iris diaphragm, and so regulate the amount of light admitted.

Only one shutter is employed, which acts as a cap, and also as a shutter, which can be employed either for time exposures or for instantaueous work. This shutter is attached to mechanism operated from outside the camera by a system of knobs, and kept normally in position over the leus by a spiral spring. By this shutter the aperture of the leus is ouly momentarily uncovered.

## Correspondence.

### NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS OF GREAT BRITAIN AND IRELAND.

Sir,—The adjourned meeting of the council of the above Association will be held at Anderton's Hotel, Fleet Street, London, Monday, November 9th, 7.30 p.m., to receive a report from the secretary upon general and important business. Any suggestions from the profession generally will be gladly received by the Secretary, Auderton's Hotel.

*October 27th.* D. J. O'Neill, *Secretary.*

### A PHOTOGRAPHERS' ASSISTANTS' CLUB.

Sir,—Seeing that we have so many and such various photographic associations and clubs, I feel rather surprised that we have no club in this vast metropolis for photographers' operatives. If we consider what a great boon such a club would be for the assistauts of our art, I think it highly desirable that no time should be lost in starting the formation of this so long missed iustitution. Kindly let me give a rough idea of what character such a club should be.

Firstly, educational, by giving weekly onc night for lecturiug or reading on photographic matters ; having a free library and a reading room ; holding one anuual exhibition of members' own work.

Secondly, social, having one night in the week a social gathering, flavoured with magic lantern entertainments ; also an annual excursion if possible.

Thirdly, beneficially, by keeping a free registry for vacancies.

Of course a great many items could be added to the above, but as these few lines are merely by way of suggestion, others, I hope, will try and give their opinions on the matter.

Should any of your readers feel inclined to give support to this venture, please let them communicate with me at once, so that we may have an early general meeting to discuss matters more fully. "Operative."

74, *Rattray Road, Brixton, S.W., October 27th.*

### NEW IRON SALT.

Sir,—Will you be so kind as to find space in your next publication for my most emphatic denial of all knowledge of the presence of silver in the paper I gave Mr. Varley.

92, *Piccadilly, W., October 27th.* Friese Greene.

## Proceedings of Societies.

### Camera Club.

*October 22nd.*—Mr. Lyonel Clark in the chair.

Mr. Henry Sutton read a paper, and gave a demonstration, on the subject of "Reversal." The lecturer exposed a plate to magnesium light a sufficient time to produce the insensitive state of the plate by oxidation, and another plate not so treated was taken, and the pair exposed in contact with a negative. One plate gave a reversal, and the other showed the undevelopable and insensitive state. The plates used were isochromatic plates, and they were put into the frame in the full light of the room. Mr. Sutton also showed experimentally how a similar appearance to the "dark flash" in lightning photography could be produced by magnesium light.

In the discussion which followed, the Chairman referred to the early and complete experimeuts in reversal carried out by Claudet, and to the recent book of M. Clayden in regard to electricity and the dark flash phenomenon in photography.

On October 26th a large number of lantern slides was exhibited, about 350 transparencies being brought or sent up by members to be shown, including work by Messrs. Dresser, Andræ, Greene, Griffith, Barton, J. C. H. Smith, Starbuck, Fitz-Payne, Freshwater, Powell, Davis, Ferrero, Chang, and Barton-Kent.

On November 2nd the monthly smoking concert will be given. On November 5th Dr. J. J. Acworth will read a paper ou "The Action of Light and Heat upon the Haloid Silver Salts."

### London and Provincial Photographic Association.

At the meeting of this Society held on the 22nd inst. Mr. W. H. Harrison occupied the chair.

Mr. A. L. Henderson showed a negative covered with markings, which he attributed to the paper that had been used for separating the plates. He urged that the Society should take up the matter with a view to induce plate-makers to adopt other means of packing, and eventually moved a resolution that, as some plate-makers are in the habit of packing plates with paper all over, and that, as markiugs sometimes occur therefrom, it is desirable that some better method of packing be adopted, and it is suggested that small pieces of tinfoil would be better, and probably not more expensive.

Mr. W. E. Debenham had had plates marked from contact with separating paper, though not recently. A method of packing which he had met with seemed to be very good. This was to place a complete mat of thin card between the sensitive surfaces. Plates of very high rapidity packed in this way by the Seed Company some two years since he had recently found to be in excellent condition. He questioned the utility of passing a resolution in the form proposed.

Mr. A. Cowan thought that the markings on the particular plate shown were due, not to the paper used in packing, but to light penetrating through the wrappiug paper.

Eventually the resolution was passed.

Mr. J. S. Teape said that no doubt many people had noticed the non-actinic colour of caramel, and had on that account thought it should prove useful as a light-filter for dark room work. He had coated a plate with a solution of gelatine and caramel, and exposed a plate behind a screeu so prepared. At the same time he had covered another part of the plate with two thicknesses of golden fabric. The exposures had been to a gas-flame at a distance of twelve inches for periods of five and fifteen minutes. The faiut image that developed was about equal with the two kinds of medium. Exposures were also made to the light of burning magnesium, with similar results.

Mr. Debenham said that when proposing caramel for backing, he had suggested that it might be used for a dark room light-filter, but he did not like the colour of the illumination, and much preferred the yellow light from golden fabric.

Mr. A. Haddon said that, Mr. Everitt haviug thrown doubt upon the superiority of caramel over burnt sienna as an absorbent, he (Mr. Haddon) had prepared a plate of thick glass—thick enough to show separate reflectious of a small light spot from the back and front – in four divisions: one quarter was left plain, one was coated with caramel and gelatine, one with the burnt sienna and gum mixture furnished by Mr. Everitt, and the fourth with a mixture of burnt sienna and caramel. On looking at the reflection of a distant gas-flame, it would be seen that, whilst at any angle the burnt sienna gave a distinct image, in some cases approaching the brightness of that from the bare glass, the caramel portions so completely absorbed the light that only with difficulty could the faintest reflection be discovered.

Mr. Everitt said that he had not doubted that caramel was better than burnt sienna, but he had found the latter quite sufficient.

The Chairman enquired whether any non-actinic substauce had been found that would staiu the film sufficiently to dispense with the necessity for backing without causing insensitiveness.

Mr. Henderson said that if such a stain were found there would be no density in the image; the light would not penetrate deeply enough into the film.

Mr. C. Lawrance then showed the "Clifford" hand-camera, the special feature of which was the manuer of storing and exposiug the plates or films. Holders in the form of a book contained from twelve to twenty plates—according to the thickness—or thirty celluloid films. These holders allowed of the successive exposure of the plates, whilst registering externally to the camera the number of the plate in position.

A question from the box was read, enquiring the best methods of proceeding with hydrokinone developer on lantern plates when, in one case, it was desired to produce slides of vigour from a thin negative, and in the other, to get sufficient softness from an intense negative.

Mr. Henderson undertook to go into the question at the next meeting, and it was decided for the following meeting—that on November 5—to discuss the question generally of the modification of developer and exposure for obtaining variations of intensity.

### Photographic Society of Ireland.

The usual monthly technical meetiug was held in the Rooms, 15, Dawson Street, Dublin, on the 22nd inst., Mr. Geo. Mansfield, J.P., in the chair.

The feature of the eveuing was a lecture and demonstration by Mr. John Howson, of the Ilford Company, on the Company's new printiug-out paper (see page 748), and also on making lantern slides on their alpha plates.

A vote of thanks to the lecturer termiuated the meeting.

### Oxford Photographic Society.

*October 20th.*—The President in the chair.

Mr. J. Bretland Farmer, M.A., Fellow of Magdaleu, Mr. R. A. R. Bennett, B.A., Magdalen College, Mr. J. F. Burnett, F.C.S., Mr. J. Squire, and Mr. F. J. Gadney, were elected members.

Mr. W. J. Williams resigned, as he is leaving Oxford.

A special meeting then took place, in order to revise the rules.

### West London Photographic Society.

At the meeting held in the Broadway Lecture Hall, Hammersmith, on the 23rd inst., the new aero-carbon iucandescent lamp for the optical lantern was shown by Mr. J. R. Pooles, of the Incandescent Gas Light Company, of Westminster.

Having shown a few slides through the lantern, Mr. Pooles explained the working of the apparatus. It consists of a gas apparatus of a very portable description, which feeds a burner fitted with a zirconium mantle, rendering it instantaneously incandescent, and giving a light of 150 to 180 candle power at a very small cost. Ordinary house gas can be used, but the light would be much inferior in quality. The burners will last about a year.

The President thought that the light would be found most useful to amateurs, doing away with the dangerous lime-light and the messy oil lamp, and would be especially appreciated by nervous ladies.

The President then read his annual address to the members, and congratulated them on the contiuued success of the Society, which had increased in numbers during the past year. They had had a most successful exhibition, which had been praised alike by the judges and the press, and their exhibit at the Crystal Palace, in the competition for the Challenge Cup, had ruu the winning society's one very close. They had carried off more medals than any other society, and their only fault was that their pictures were on too small a scale. If, as he proposed, the Society purchased a large camera—say, 15 by 12—for the use of the members, this fault, in a future year, might be avoided. He also referred to the question of cheap railway fares for photographers, which the Society had brought very prominently forward during the year, and regretted that, so far, they had not been successful. Having referred to the federation scheme, he called on all the members to work together for the common good. They had had provided for them a very temptiug programme for the ensuing session, but if either members or non-members could be persuaded to offer fresh papers or demonstrations, room could be found for them.

The lantern was then brought into requisition, when slides by Messrs. Bennett, Chang, Freeman, Hodges, Holmes, Rogers, and Whitear, and some prize slides by Messrs. West and Son, were shown on the screen.

Mr. Whiting made some few remarks on the question of halation and the backing of plates, and exhibited a plate he had exposed for 30 seconds to lamplight, half backed and the other half unbacked, when the difference was very apparent.

Some remarks followed by Mr. Hodges, who found that he got very little halation when using isochromatic plates.

The next meeting will be held on November 13th, and will be a technical meeting.

### Birmingham Photographic Society.

A general meeting was held at the Y. M. C. Rooms on October 21st, Mr. W. J. Harrison, F.G.S., in the chair.

Mr. A. W. Wills, J.P., delivered a lecture on "Burmah and its People," illustrated with lime-light views. Mr. Wills has lately returned from an extended tour in the East, where he used his camera with great success.

There were upwards of 300 members and friends present.

### North Middlesex Photographic Society.

*October 26th.*—Mr. F. W. Cox in the chair.

Mr. T. F. Smith, F.R.M.S., delivered a lecture on "Photo-Micrography" to an audience among whom were the local medical practitiouers. The lecturer entered fully into all details of his subject, and, demonstrating with the apparatus as he went along, showed how to place the flame of the lamp flat or edgeways, according to the focus and angular aperture of the objeetive employed, as also how to centre the light. He proceeded to make several negatives, using isochromatic plates for the purpose. The demonstration being completed, about eighty slides of Mr. Smith's making were thrown upon the screen, and were thoroughly explained by him. Amongst them were bacillus Anthracis, Koch's Coma bacillus, the tubercle bacillus, the microbe of leprosy, the microbe of caries of teeth, and about twenty other specimens of a similar nature. The other objects were diatoms and specimens of insect and vegetable structure.

The next meeting will be a lantern evening on November 9th, when visitors will be welcome.

RICHMOND CAMERA CLUB.

*October 23rd.*—Mr. CEMBRANO in the chair.

From the comparatively minor matter of "Backing Plates," an interesting and useful discussiou on the theory, causes, and prevention of halation was evolved. Mr. DAVIS opened, showing three church interiors taken on plates backed with red paper squeezed on with glycerine; one comprising a west window of coloured glass with the suu on it showed very little halation, while the other two were much halated.

Mr. KIDD attributed the extent of the halatiou partly to under-exposure, and partly to the developer used (eikonogen) being too vigorous. He then experimented on one of the plates, and succeeded in considerably lessening the mischief by rubbing down with alcohol.

Mr. ARDASEER explained the theory of halation, and of the preventive effect of backing the plate with a substance which should reflect no rays, or such only as are innocuous.

The PRESIDENT gave the result of experiments made by different workers with backed and unbacked plates, and with plates backed with various substances—as paper, burnt sienna and dextrine, collodion stained with aurine, and caramel—of which caramel was claimed to be the most effectual.

To give a practical turn to next week's discussion on "Flash-light Photography," the President has promised to take a flash-light photograph of the members present.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

AT the opening monthly meeting for this session held on October 20th in the rooms, 180, West Regent Street, Glasgow, eleven new members were elected.

Mr. JOHN MORRISON, jun., president, in his opening address, referred to the late exhibition in the Fine Art Iustitute, and congratulated the Society on its great success.

A discussion was initiated by Mr WM. GODWIN, hon. secretary, on "Printing and Toning."

The proceedings were brought to a termination by the usual exhibition of optical lantern slides.

BRECHIN PHOTOGRAPHIC ASSOCIATION.

THE aunual lautern exhibition was held in the City Hall on the 21st October; Mr. WM. SHAW ADAMSON, the president, occupied the chair. The hall was crowded to excess.

The first part consisted of the lecture set, "One Thousand Miles up the Nile," followed by a selectiou of the members' own work and dissolving effect slides.

Mr. A. R. MCLEAN MURRAY, F.E.I.S., gave the descriptive lecture, aud the lantern was under the charge of Messrs. Dakers and Innes.

The admission was by free ticket, and a collection was taken at the door amounting to £9 7s. 6d.

This has been the most successful exhibition given by this Society. Great interest is taken in its work by the towns-people, of whom one-tenth witnessed this exhibition.

LADY LANSDOWNE, who, like the Viceroy, takes a great interest in photography, has accepted the houorary office of Patroness of the Photographic Society of Iudia.

MR. WILLIAM TYLAR sends us the fourth edition of "Photography in a Nutshell," which, he informs us, has been re-modelled and in great part re-writteu.

THE *Queen*, in its issue of October 24th, gives illustrations of photographs exhibited by ladies at the Photographic Society of Great Britain, these including "A Copper" (two), and "Bobby and Olive," by Miss C. Roche; aud "A Frosty Morning at St. Moritz" (two), by Mrs. Main.

## Answers to Correspondents.

**All Advertisemente and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the PHOTOGRAPHIC NEWS, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this co'uınn should be addressed to Mr. John Spiller, F.C.S., 2, St. Mary's Road, Canonbury, N.**

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.**

A. H.—*Quick-Acting Lenses.* The particulars have been sent on to you by post. With shortened days and bad lighting, the opportunities of employing the detective camera for outdoor work must now be necessarily limited.

OLD SUBSCRIBER. — *Mechanical Printing Processes.* As a preliminary, you should enter upon a course of reading, and then get, if possible, some technical instruction under a good practical teacher. Read Mr. W. T. Wilkinson's "Photo-Lithography, Collotype, &c." (London, Hampton, Judd, and Co.), Mr. Bolas's Cantor lectures on "Photo-Mechanical Processes" (Piper and Carter), Ernst Lietze's "Modern Heliographic Processes" (New York, Van Nostrand Company), Frederick Ives' "Recent Advances in Photography" (*Jour. Franklin Institute*, 1888); also Mr. Warnerke's "Simplified Collotype Process," and other photo-mechanical papers recently published in the NEWS. Your northern address, so far from any great business centre, presents a difficulty in the way of getting practical instructiou, but we will endeavour to assist you when the time comes. Collotype is certainly the easiest to begin with, so you should proceed to attack that first.

OPERATOR.—*Argand Flash Lamp.* The instrument is figured and described at page 182 of "Fallowfield's Annual." The "Smoke Trap," which goes with it, was shown by Mr. James in last year's Photographic Exhibition. This effectually disposes of the maguesia fumes, and prevents their diffusion into the atmosphere of the studio.

R. J. M.—*Out-door Work.* The prints of Lowestoft Harbour, Fritton Decoy, and ship *Sea Breeze* in Shoreham Harbour, are all good, the clouds in the latter being excellent. Try to screen off the dark hull by a light wash of colour, and so get an improved effect, which would then be worth enlarging. From what you say about the rising front, it seems probable that your camera uight not have been sufficiently light-tight for the red label plates.

PHARM.—*Exhibition Notice.* Thanks for the cutting from *The Chemist and Druggist* of 10th inst., which we had not previously seen. The remarks about the meagre show of apparatus are hardly justified, although some of the other criticisms may be true.

F. R. M. S.—*The Weather in October.* With a rainfall of about double the average amount, floods and all sorts of disasters have come upon us, besides the actual loss of light attendant upon so many consecutive rainy days.

P. L. (Edgbaston).—*Laboratory Fittings.* Consult the catalogues of Messrs. George Houghton and Sons, High Holborn, and Messrs. James Woolley aud Co., 69, Market Street, Manchester.

B. E. N.—*The Aluminium Light.* The fact is not new, for Mr. Bolas showed the experiment of burning the metal in oxygen at one of the Cautor lectures, and pointed out its photographic use; but the difficulty has hitherto been solely that of procuring the aluminium leaf, which will vanish as soon as the demand arises.

PECKHAM.—Tents and operating boxes are in common use. A very good specimen of the latter is now on view at the Pall Mall Exhibition.

*** The Editor will be greatly obliged if intending Contributors to the YEAR-BOOK will send in their MSS. in the course of the ensuing week.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1731.—*November* 6, 1891.

CONTENTS.



## THE STORAGE AND PACKAGE OF NEGATIVES.

Now that the photographic season, so far as landscape work is concerned, is on the wane, the careful worker will do well to consider the best way to preserve the negatives which, during its short continuance, have been added to his store. It is true that the past season, on account of its trying climatic vagaries, has not been so productive as many of us might have wished, but all the same, a certain number of negatives have been secured by most workers, and it behoves them to adopt the best means of preserving them for future use, if they are worthy of such an attention.

Although we cannot endorse the opinion of certain old-fashioned photographers, that gelatine negatives can never equal those produced in *their* time by the wet process, we are quite willing to concede the point that wet-plate negatives are not liable to that swift deterioration which is apt to overtake their modern representatives in gelatine if preventive measures be neglected. Everyone knows that a gelatine negative, if left unheeded on a shelf or elsewhere, exposed to the gamut of atmospheric changes with which we are favoured in this climate, will quickly show signs of impending dissolution. If it has never been varnished, its case is from the first almost hopeless. Spots with a metallic sheen around them quickly appear, or, possibly, the entire film assumes a pale yellow tone, which will yield but a ghost of a print. Varnish of good quality is a wonderful preservative, and if this varnish should be applied on a basis of plain collodion, or be mixed with the collodion before application, as recently recommended by Mr. A. L. Henderson, we may say that every precaution has been taken to ensure permanency so far as the film itself is concerned.

The method of storing negatives must naturally accommodate itself to the business requirements of the owner. Where negatives may be required at any moment for printing from, it is essential that they be easily accessible, so that no time is lost in searching for them. In a large establishment, where an immense business is done for the trade, we have seen the negatives stored in grooved shelves, each groove having its distinctive number. There is no objection to such a plan provided that the place of storage is kept perfectly dry, for it is evident that the air must circulate between the plates thus stored, and moist air under such conditions would be capable of harm. In many respects, this method is preferable to the storage of negatives in grooved boxes, from which receptacles we have taken forgotten negatives which were covered with mildew, and spotted all over beyond redemption. When the negatives are comparatively few in number, we know of no better plan than to store them in the original plate boxes as received from the maker. Every negative should be well varnished, and packed face to face with its fellows, a piece of clean, soft paper of the same size being placed between each pair of films. Then, if the original cardboard box be thoroughly dried by heat before the negatives are placed in it, and if, finally, the packed box is put in a tin case—like those recently introduced by Messrs. Wratten and Wainwright—there need be no fear that the negatives will spoil.

But perhaps the most fruitful source of spoilt negatives is not gradual deterioration, but the hopeless smash which so often is the direct result of sending one through the post or by ordinary carrier. We have many a time received a negative upon which the owner has desired an opinion, and the only one which we have been able to give is the opinion that it arrived in too many fragments for critical examination. Of course the poor postman or carrier is the scape-goat, and all the blame is cast upon his rough handling and stupidity. But it is hardly fair that this should be so, for, truth to tell, the mischief has arisen almost invariably from the method of packing. In one case, the glass negative was sent to us in an ordinary dark slide packed in paper, and the vibration of a long railway journey was too much for it. In other cases, the glasses have been actually sent to us through the post in ordinary envelopes, and have naturally been starred into fragments by the obliterating stamp at the post office.

From these circumstances, it would seem evident that certain persons who take photographs have not yet mastered the elementary fact that glass is brittle. Can they wonder that the Post Office authorities refuse to encourage such ignorance by granting compensation for broken negatives? There is really only one reliable method of sending a negative by post, and that is, to take care that it has a soft packing all round it, and that the external covering be of a rigid nature. The system which we have adopted, and by which we have never yet lost a negative, is as follows. We procure a wooden box an inch larger each way than the negative which is to be packed within it. This we half fill with a level layer of dry sawdust or bran. The negative, previously wrapped in soft paper, is laid upon this bed, after which the box is filled up with the same material, and the lid is nailed on. If this simple work be carried out with intelligence, the box can be thrown about without any risk of the enclosed negative being fractured. As a further precaution, however, a ticket bearing the word "fragile" should be attached to the box, and such tickets can be had for the asking at any post office where parcels are received.

## NEW USE FOR THE CAMERA.

AMERICANS, says the *Public Ledger*, should by all means—both men and women—when their mouths have assumed the mature expression, with all their teeth perfect, have their mouth and teeth photographed, so as to ensure that the artificial dental artist shall get the correct physiognomy when his services have to be called in. There is so much expression in the teeth; the entire face can be altered if a dentist furnishes the jaw with a widening, flattening row of large, handsome ivories to replace a curved and slightly irregular row of tiny natural teeth. The extreme change in the expression so produced requires almost another lifetime for one's friends to become accustomed to it. The fact is, the dentist's idea of teeth is that of a regular fence of polished and gleaming material, although considerable attention is now paid to colouring—yellowish or blue (pearly) teeth being now manufactured with wonderful likeness to nature; but the shapes and sizes still require much modification and many irregularities to make them resemble the natural teeth, which have their characteristic differences from other people's, and even from each other. How are the craftsmen in teeth to imagine these things, as the mouth has lost many of its chief ornaments before even the dentist—who chooses from sample—is called to replace the missing pearls? To secure identity in your manufactured teeth, then, it is wise to photograph your natural ones, so that their expression and form may be preserved. The dental industry can do wonders, but it cannot match what it has never seen; so the camera—now a family toy—may as well serve in preserving the mouth, with its complement of teeth, as a guide to the dentist's future labours. False teeth need not be unnatural, nor would they, if made to match a photographic sample, give the wearer the cynical expression that sometimes replaces all others when the workman has done his most ignorant best for your comfort, but not for your looks.

## ON THE USE OF SMALL STOPS.*

BY W. H. WHEELER.

BUT now to consider objections or prejudices against small stops, when generally photographing subjects in which little or no movement is to be feared. As for *foliage*, it is much more easy to cap the lens during movement and uncover it during still intervals, when the stop is small and the exposure long, than with a large stop and short exposure. I remember once, several years ago, in exposing a very large wet plate, that it took about three-quarters of an hour to give seven minutes' exposure—part of it in shade and part in sunshine; all, however, during still intervals. It was very successful, is printing now, and a few weeks since a copy went into Royal hands. But some men would be aghast at the idea of taking all that time about one exposure, even of a wet plate, out in the open street.

Because a man has accustomed himself to pretty large stops and quick exposures where speed was really essential, he too often does the same where no such necessity exists. At any rate, he deems it strange, unnecessary, and absurd to give the long exposure required by the small stop he might use, even without any definite reason for urgent speed. Perhaps he fears being laughed at, or half instinctively associates a small stop with something inartistic. Let him carefully shield his shadows from stray light, give a sufficient exposure according to his stop, and let them laugh that win.

Perhaps, however, he may think that opticians must, of course, know best; that he constantly reads in the papers of exquisite and most artistic results with large stops and short exposures; and that, if very small stops were the right ones to use, opticians would certainly always provide them. But this, in the proportion required for large sizes, and to allow for the use of swing-backs in architecture, they rarely do. Also, as I have endeavoured to show in the early part of this paper, the question is rather one of the peculiar advantages and disadvantages of photography than of optics generally, and should not be left entirely to opticians. Besides, accuracy of definition with large apertures is the natural pride of the optician. He cannot be expected to hide his light under a bushel, nor is it, strictly speaking, his proper business to provide for depth of focus in depicting still life. The much-contested "diffusion of focus" lenses were planned especially for portraiture, and to portraiture they are best suited. There is one point, however, in connection with small stops on which I cannot but think opticians have really and generally erred. Surely, they know better than other men that, whatever need exists for a small stop—either for depth of focus, flatness of field, or the sharpening of the image at the top and bottom of the plate when we require to use a swing-back—increases in an extremely rapid ratio with the increased scale of image naturally accompanying the use of longer focus lenses to cover larger plates (the minimum ratio is as the squares of the focal lengths, for the same view and standpoint). Yet the ordinary range of stops is commonly made *uniform for all sizes!* Opticians have, indeed, followed where surely they should have led, and the only remedy would seem to be the education of the purchaser, when doubtless an intelligent demand will be readily supplied. The difference in the stops needed for half-plates, 12 by 10, and 24 by 18 plates respectively, is realised by but few photographers, and is apparently

* Concluded from page 748.

practically recognised by no optician; for, to obtain the same delicacy and depth of focus, &c., on these three sizes, for similar views, from similar positions, and lenses, of course, of proportionate focus, if the half-plate were $f/16$, the 12 by 10 (according to theory) should be $f/64$, and the 24 by 18 $f/256$! It is a convenient practical compromise to use a stop of about the same actual diameter for each size, all other circumstances being equal; and such a stop—as a *small stop*—might be about $f/32$, $f/64$, and $f/128$ on these three sizes respectively. For very difficult subjects, and still larger plates, I have occasionally gone to $f/216$ with advantage. And on the other hand, on a 30 by 25 plate exposed a few days since, favourably circumstanced for equal definition, an excellent image was obtained with $f/120$, although a rising front of fully twelve inches was used, the lens being, indeed, placed opposite the top of the plate. May I venture here to suggest to opticians that, by adding, say, one smaller stop to each larger size of, at any rate, non-aplanatic lenses, they would, as it were, officially recognise a sound optical truth.

But it has been often assumed, though less confidently than was once the case, that a very small stop *always* causes some loss of brightness, or of atmosphere, or of range of half-tone. I say assumed as a generally known fact, for I have never seen an attempt to prove it or deduce it in any way from established premises. Of course we know that, if any stray light enters the camera *during exposure*, whether through the lens or otherwise, its injurious effect is directly as the time during which the plate is exposed to it, and if through a leaky camera, it is not checked even by capping the lens until the slide is closed again. Under such circumstances, a small stop may appear to produce loss of brilliance, from which a negative quickly exposed with a large stop may be comparatively free. Nevertheless, the fault is with the camera, not with the stop. I am inclined, however, to trace this erroneous view less to the wrong interpretation of a fault really due to stray light, than to a very natural but fallacious association of ideas suggesting the following misconception.

We all know that, when a landscape or architectural view is brilliantly lighted, we can generally obtain from it a better negative than when poorly lighted. It is naturally more vigorous, because the clearer the sunshine, the more brilliant and effective is the contrast between sunlight and shadow, and we can give a fuller exposure without flatness. In this way we come to associate, not unnaturally, the idea of a weak light with the effect of a weak contrast; not that we do so exactly as a distinct relation betweeen cause and effect, thought out or tested, but as a natural association of ideas adopted, as a matter of course, without really thinking about it. Thus, when we look on the focussing screen and see that the image, when a large stop is inserted, is much more brilliant and effective to the eye than with a small one, we are apt to fear from the smaller stop the same photographic dullness that we seemed to see on the screen as visual dullness. Yet as the mere change of stop in a light-tight camera cannot really alter the relations of contrast in the lighting, and as mere want of illumination can be fully supplied by proportionate increase of exposure, we may confidently expect that a view taken with a small stop and duly exposed without stray light shall be as brilliant and soft, and as full of half-tone and atmosphere, as though taken quickly with a large stop under the same lighting, while it may, of course, be far more accurately defined. Indeed, were it not so, what would become of our interiors? They can be brilliantly rendered with a proper exposure—the definite direction of the light generally supplying well-marked shadows and contrasts—with so dull a light that the necessary exposure, even with a large stop, is far longer than for the dullest exterior with the smallest stop. I have exposed a 15 by 12 quick isochromatic plate in a dark chapel from Saturday afternoon until past noon on Monday in brilliant summer weather, using a stop of $f/36$, with brilliant effect, though a ten-thousandth part of the exposure might have been enough out of doors—perhaps, indeed, *too much*—and doubtless there are hundreds of similar experiences. I am persuaded that the fallacy I have described, obvious as it seems when definitely presented, has really had an extensively misleading effect on the views of some whose opportunities for practice are rather behind their inclination to theorise.

There has been yet another prevalent fallacy about very small stops, that the physical effect of *diffraction* is practically and perceptibly injurious when such small stops are used as I have mentioned. But I believe that since an examination by Captain Abney some years since, in which he obtained from theory results almost identical with those I had recorded (in a paper overlooked by him) as the results of a merely empirical estimate, this idea has been exploded. The practical results obtained were that this error was *inversely* as the *intensity* of the lens used, but might be practically disregarded until that intensity fell below about $f/200$ for central definition; how much lower for oblique pencils cannot be stated.

Perhaps there is scarcely any work which gains more by the use of really small stops—even with the finest aplanatic lenses—as *copying*. It seems curious that, for really delicate definition in copying, so very much more accurate optical means should be required than for photographing from nature. The similarity in the relations of optical definition between an original and a copy to those I have remarked as subsisting between an optical image directly seen through an eye-piece, and a print from a negative obtained from that same optical image, rather illustrate the phenomenon than explain it; but it may help us to appreciate the special value of aplanatic lenses and small stops in first-class copying. The best of lenses, which should be of ample covering power; the smallest of stops; the extremest nicety in protecting the lens from all stray light, and confining it to the actual subject presented, to the exclusion, where possible, of even its white margin; perhaps I might add, too, the slowest of plates, and certainly the utmost care in securing to the subject an indirect but flat lighting, so as, while diverting light regularly reflected from its surface, to destroy such texture of that surface as might be thrown into prominence by an unbalanced side-light—all so contribute to improve the result, that even expert judges will often fail to distinguish between a really good copy and a good original, easy as it is to detect copies as ordinarily produced. Everyone does not choose to take all the necessary precautions, or to afford time for the necessary exposure; but neither must be grudged if we would have the very best results.

Finally, to all other objections to small stops have been added that known as "naturalistic." This I regard as founded on a general misconception of the true theory of vision—a failure to recognise that such a general perception as we have of any view, however extended, has been naturally built up by vision of each part successively brought to the exquisitely sensitive "fovea centralis," or central pit of the retina: as interest is excited, the attention called, and the eye directed to or "run over" its details by the ever-active volition. In this way, the whole mental image, though not all equally vivid, is all equally distinct. The comparative optical indistinctness of oblique vision never, in the natural visual perception, really makes any particular impression on the mind, its supposed part in the mental image really owing its vividness and distinctness rather to the memory of what *had* been seen when the eye was turned that way, and its special use being to guide this natural movement. At the same time, there is no doubt that, in the artistic indication and direction of a studied emphasis, cases may occur in which fine effects accompany a photograph where the principal object, and that *alone*, is sharply defined, as well as sharply contrasted; but unless this principal object needs no nearer foreground kept specially sharp to throw it back, and lend to it dignity with distance, a smaller stop will be an advantage even here, enabling us to accompany subordination of accessory detail—attainable at will by art in printing, carefully covering up, with added flushing, or sunning, as best meets the case—with the absence of such indistinct fuzziness as may be borne with in an artist's sketch, but scarcely admired in his finished picture. Here, again, we have the advantage, for our finishing, as to detail, being a natural process, costs no labour, and therefore is likely to convey no undue emphasis. The due subordination of accessory details in printing is essentially artistic because it serves an object intelligently sought, and is not an operation purely mechanical, or, like the course of irrational matter, blindly following an impressed law. Thus, it is more truly in accordance with our visual perception, in which selection and emphasis are the result of intellectual rather than physical causes. A true visual theory is required rightly to direct us towards the connection of photography with true art, and towards true art we trust ever to direct our efforts. Probably the best of us are always those least satisfied with their own work, our ideal constantly stretching out interminably before us. We feel as does the painter, the "ars longa, vita brevis," and, like him, find life too short for our work; but if any subordinate quality can give to us pleasure ever fresh, and with the least possible alloy of dissatisfaction, surely it is the delicate detail of natural beauties which hide themselves by their very delicacy and minuteness from all but the close observer. Their representation in the photograph, subordinated though accurate, and only recognised by a close inspection, corresponds well with the reality, itself only seen by the lovingly attentive eye.

A MAMMOTH CAMERA. — Messrs. Buchanan, Bromley, and Co., dealers in photographic goods, have just delivered to a local photographer what is, doubtless, one of the largest cameras ever made. It will take a plate 30 by 40 inches, while the largest plates now mentioned on the plate-makers' lists are 20 by 24 inches, about one-third the size. The camera was made by the Scovill and Adams Company, of New York, of fine mahogany, the track on which the rear part slides being rosewood. When fully extended the camera is 66 inches long, and when closed is 16 inches thick. The two plate-holders have curious slides. The printing frame accompanying the camera is correspondingly massive. The use to which the apparatus is to be put is not revealed by the purchaser, beyond that it is to be employed in work for the National Government. A small lot of plates secured from a St. Louis maker, to fit the holders of this mammoth camera, cost the purchaser at the rate of 45 dollars a dozen.—*Public Ledger*, Philadelphia.

## BALLOON PHOTOGRAPHY

AN article in the last number of *Knowledge* by Mr. A. C. Ranyard, the accomplished editor of that interesting periodical, has some photographic interest, in that it deals with Mr. Shadbolt's photographic experiences in cloud-land. The article is illustrated with four capital collotypes from Mr. Shadbolt's photographs, which are, perhaps, the best pictures of the kind which have ever been published. We abstract from the article that portion of it which should be of the greater interest to our readers. It is printed under the title "The Upper Atmosphere."

"I am enabled this month, through the kindness of Mr. Shadbolt, to lay before the readers of *Knowledge* some photographs taken from balloons at various altitudes. Mr. Shadbolt is a very experienced amateur aeronaut who has made over sixty ascents, and he was, I understand, the first to take a recognisable photograph from a balloon, in June, 1882. The rays of light which fall on a photographic plate exposed from a balloon have had to pass twice through the densest and most dust-laden strata of the atmosphere. Even in photographing distant landscapes from the surface of the ground, very little detail is ordinarily obtained upon distant hills, owing to the absorption of the photographically active rays in passing through a great distance of the lower atmosphere. But the difficulty is greatly increased in attempting to photograph the distant earth from a great altitude in a balloon, for not only is the absorption increased by the long course of the rays through the lower air, but the observer sees the dust-motes in the atmosphere from their sun-illuminated side. The vale of haze spread over the earth, therefore, hides the objects behind it more effectually than the transparent veil of haze which we ordinarily see over a distant landscape, giving the soft effects of distance which artists so well know.

"An observer with a giant telescope, on Mars or on the Moon, would probably see much less of what is going on on the surface of the earth than we are apt to imagine. The white upper surfaces of the clouds would first attract his attention, with, in between them, a very dim and hazy view of objects on the earth's surface, rendered all the more difficult to observe by the frequent presence of a dazzlingly bright patch of sunlight reflected from the sea. To a naked eye observer on Mars, the earth would probably appear like a variable star, with a curious and mysteriously irregular period of variation, due to the change in the brightness of the specularly reflected patch of sunlight as terrestrial clouds covered it up, or the rotation of the earth brought continents or seas to the part of the earth's surface from which specular reflection could take place.

"The exposure of photographs taken from a balloon must necessarily be short, for the balloon generally drifts along with considerable velocity, and sometimes it revolves. The revolution is, however, never very rapid, and it is generally more noticeable as the balloon descends than as it rises, owing to the greater irregularity of the car and under-surface of the balloon as compared with the comparatively spherical surface which it presents to the air on rising. With reference to the velocity with which balloons travel, Mr. Shadbolt is of opinion that they do not, as a general rule, travel so rapidly when at a considerable altitude as they do when nearer to the earth. Since this is contrary to the usually received opinion with regard to the velocity of the wind at various altitudes, and Mr. Shadbolt's judgment is founded on very full notes which he takes during his balloon voyages, as to the time of passing over various places, I give the following extract from a letter he obligingly wrote me on the subject. Mr. Shadbolt says: 'I have invariably found the wind near the earth—say up to 1,500 or 2,000 feet—to be stronger than at higher altitudes. I have frequently mounted up to take refuge from an approaching squall, and it has overtaken the balloon and passed below it, while nearly always when above the clouds they appear to travel along at a more rapid speed, and to pass along beneath the balloon. The same thing is noticeable when there are no clouds; you take your bearings and scarcely seem to be moving until you drop down near to the earth. Some might say that this would naturally be due to the distance you are from the objects below, making a quick movement appear to be slow; but after some practice you learn to recognise the actual rate at which you are passing over the ground below you.'"

## NEW LABORATORY PROCESS FOR PREPARING HYDROBROMIC ACID.

BY G. S. NEWTH.

This method is a synthetical one, and consists in passing a stream of hydrogen and bromine vapour over a spiral of platinum wire heated to bright redness by means of an electric current. A glass tube, about 7 inches long and ⅝ of an inch bore, is fitted at each end with a cork carrying a short, straight piece of small tube; through each cork is also fixed a stout wire, and these two wires are joined by means of a short spiral of platinum wire, the spiral being about 1 inch long. One end of this apparatus is connected to a small wash-bottle containing bromine, through which a stream of hydrogen can be bubbled. The other end is attached to a tube dipping into a vessel of water for the absorption of the gas, or, if a large quantity of the solution is required, to a series of Woulf's bottles containing water. Hydrogen is first slowly passed through the tube until the air is displaced, when the platinum spiral is heated to bright redness by the passage of a suitable electric current. Complete combination takes place in contact with the hot wire, and the colour imparted to the ingoing gases by the bromine vapour is entirely removed, and the contents of the tube beyond the platinum are perfectly colourless. The vessel containing the bromine may be heated to a temperature of about 60° C. in a water-bath, at which temperature the hydrogen will be mixed with nearly the requisite amount of bromine to combine with the whole of it. So long as even a slight excess of hydrogen is passing, which is readily seen by the escape of bubbles through the water in the absorbing vessels, the issuing hydrobromic acid will remain perfectly colourless, and therefore free from bromine; so that it is not necessary to adopt any of the usual methods for scrubbing the gas through vessels containing phosphorus. When the operation is proceeding very rapidly, a lambent flame occasionally appears in the tube just before the platinum wire, but this flame is never propagated back through the narrow tube into the bromine bottle. The precaution may be taken, however, of plugging this narrow tube with a little glass wool, which renders any inconvenience from this cause quite impossible. By this method a large quantity of bromine may be rapidly converted into hydrobromic acid without any loss of bromine, and the operation, when once started, can be allowed to proceed without any further attention.—*Chemical News.*

## PHOTOGRAPHY IN AUSTRIA.

BY PROFESSOR ALEX LAINER.

### On Benzole Matt Varnishes.*

*Benzole Matt Varnish.*—In photographic literature are to be found a number of receipts for matt varnish,† but without giving details of the limit of additions. So I undertook systematic experiments concerning the preparation of benzole matt varnishes, resulting, among other things, in the discovery of the new matt varnish described in this journal May 15th, 1891. By reason of these experiments, the preparation of matt varnish appears to be greatly facilitated, and any matt varnish can easily be modified as required. The simplest benzole matt varnish is obtained by adding a certain quantity of benzole to an ether sandarac solution.‡

1. *On the Concentration of the Solutions of Sandarac.*—For ordinary purposes I choose the sandarac solution in a proportion of 1 to 9 or 1 to 10. The following remarks refer to a solution of 100g. of sandarac in 1,000 cm.$^3$ of ether. Diluted solutions give thinner coatings of matt varnish and finer grain; but, in consequence of their tenderness, the coatings cannot resist powerful retouching with colours laid on wet, whereas with the stump and a soft pencil they can be worked very well. More concentrated sandarac solutions (1 to 6) produce thicker coatings of matt varnish, it is true, but these latter easily become streaky in pouring on. One can all the more dispense with the use of concentrated sandarac solutions, as in colouring the matt varnish one possesses an excellent means of covering thinness.§

2. *On the Addition of Benzole.*—With an addition of 35 cm.$^3$ of benzole to 100 cm.$^3$ of the ether sandarac solution (1 to 10) I got perfectly useless transparent coatings, which, at the same time, are very brittle. 40 cm. of benzole produced a weak but totally useless matt varnish, whereas 100 cm.$^3$ sandarac solution and 45 to 50 cm.$^3$ benzole produced coating perfectly matt, but with the use of various sorts of benzole they were sometimes unequal. If one goes beyond this addition of 50 cm.$^3$ of benzole, the grain of the matt coating becomes somewhat coarse-grained, and with 65 cm.$^3$ benzole the grain is flocky, and lacks clearness. An excellent corrective for this grain is formed by the addition of some drops or cubic centimetres of alcohol.

3. *On the Addition of Alcohol to Benzole Matt Varnishes.*—If the addition of benzole be increased to 65 cm.$^3$, the solution itself sometimes appears rather turbid, and the matt coating becomes coarse-grained. If one now adds alcohol‖ to this matt varnish, not only does the solution possibly become clear at once, but also the grain of the matt coating appears very satisfactory. I always obtained excellent results with the following formula:—

* From the *Photographische Correspondenz.*

† With some of them no matt coating is obtainable.

‡ Coal benzene or benzene corresponds to the formula $C_6H_6$. It boils at 88° C., and, in a chemically pure condition, at a temperature of 15° has a specific gravity of 0·884, or, according to Mendelljeff, at 15½° C., 0·850. The benzole I used had a specific gravity of 0·820 at 20° C. Benzene, or petroleum benzene (specific gravity 0·63-0·68), boils at about 50° C. A very small addition of it separates the resin from sandarac solution; a larger addition produces lumpy extractions. For the distinction between benzol and benzene by means of iodine, see *Photographische Correspondenz*, February, 1891.

§ See the *Photographische Correspondenz* for May.

‖ I used absolute alcohol.

*Formula* 1.

| | |
|---|---|
| Solution of sandarac (1 to 10) ... ... | 100 cm.$^3$ |
| Benzole ... ... ... ... ... | 65 ,, |
| Alcohol (absolute) ... ... ... | 2 to 4 ,, |

The addition of 4 cm.$^3$ of alcohol makes the matt coating more transparent than does 2 cm.$^3$ of alcohol. If one increase the amount of alcohol to 6 cm.$^3$, one gets unequal matt coatings; with 8 cm.$^3$ of alcohol no matt coating can be obtained. The formation of grain is prevented.* A dilution of the above varnish with 20 cm.$^3$ of ether produces a matt varnish which flows very easily, and makes more transparent and tender matt coating, but which, as already mentioned, is very easily damaged. Even a dilution with 40 cm.$^3$ of ether still permits the formation of a very tender matt coating, which, in certain cases, can do retouching very good service. An addition alternately of alcohol and benzole acts on the benzole matt varnish as follows. Adding a small quantity of alcohol makes the grain finer; if one then adds benzole, the coating becomes coarse-grained, and at the same time more transparent. This is to be understood so; the grain separates in more compact little lumps, by which means its interstices become larger. A renewed addition of alcohol again produced close grain; thus the coating appeared less transparent. By adding benzole, alcohol, ether, and solution of sandarac alternately, any matt varnish may be modified at pleasure, so that it is never necessary to throw away unsuitable matt varnish, presupposing that one has employed pure, *colourless*, cool benzole, and not petroleum benzene.

4. *On the Addition of Dammar and Mastic.*—10 g. of the dammar-resin of commerce were treated with 100 cm.$^3$ of ether; the solution was not complete. Further, 10 g. mastic were dissolved in 80 cm.$^3$ ether. Neither of the solutions produces matt varnish if treated with benzole or toluol; but the influence on formation of grain in ordinary matt varnish—mastic in particular—acts astonishingly. The matt coatings become softer with a considerable addition of mastic or dammar—nay, even sticky—and, before beginning the retouching, must be allowed to dry for some minutes. With the following mixture I obtained a good sandarac-dammar matt varnish:—

*Formula* 2.

| | |
|---|---|
| Sandarac solution (1 to 10) ... | 50 cm.$^3$ |
| Dammar solution (1 to 10) ... | 50 ,, |
| Benzole ... ... ... ... | 50 ,, |
| Alcohol ... ... ... ... | 2·5 ,, |

The alcohol is added gradually as required, and, after each addition of alcohol, one prepares a specimen plate. In the above formula the quantity of dammar may be diminished; increasing it to 80 cm.$^3$ produces cloudy coatings not sufficiently matt; a grade between, even without alcohol, produces useful, delicate matt coatings. I obtained a very fine grain with the following mastic matt varnish:—

*Formula* 3.

| | |
|---|---|
| Sandarac solution (10 to 100) ... | 90 cm.$^3$ |
| Mastic solution (10 to 80) ... ... | 10 ,, |
| Benzole ... ... ... ... | 50 ,, |
| Ether ... ... ... ... | 20 ,, |

An increase of the mastic solution leads to milky-looking matt coatings, but which do not become regular, and look cloudy.

5. *General Remarks.*—Mostly one may at once retouch on the matt coating with a soft pencil No. 1; if harder pencils are used, the coating must first dry well. The bottles of matt varnish must be kept well corked, as the ether evaporates very quickly, resulting in coarse-grained coating. Matt varnish coatings will bear washing with cold water, and may therefore be treated with water-colours. Warming does not hurt the matt coating, and the use of hard pencils is thereby made easier. Chloroform and coal benzole spoil the matt coating; bisulphide of carbon does so less; petroleum benzene not at all. Thus, the matt coatings must not be covered with ordinary solutions of india-rubber to protect the retouching, but, according to Dr. Albert's proposal, a solution of gutta-percha in benzene would probably be suitable.

* In toluol matt varnish, the effect of an addition of alcohol is not so good as in benzole matt varnish.

---

Automatic Photograph Company. — A special meeting of this company was held on the 28th ult. at Winchester House, to receive the report of a committee of investigation as to the position of its affairs. The committee reported that, if the full capital of the company had been subscribed, or even had its crippled capital been more carefully and watchfully administered, under contracts less onerous to the company, the company might, perhaps, have been able to tide over the interval necessary for perfecting the machines and reducing the expenditure for plaques, so as to make their operations profitable. But the machines had been worked at a steady loss, until the entire resources of the company had been exhausted. To continue the company, therefore, in its present insolvent condition would be to deteriorate the value of the patents. The committee, therefore, saw no course but to recommend a voluntary winding up of the existing company, but were of opinion that the patents were proved to be of very considerable value, and that a reconstructed company, with moderate capital, to enable it to modify and improve the machines and reform the system of plaque supply, might be able to return a substantial dividend to its shareholders. Admiral Sir R. Macdonald presided, and stated that the best was done to work the machines, but for five months they never registered a day when a "photo" could be taken. When he was told they should wind up the company, he replied that they were bound in justice to the shareholders to show what the machines were capable of doing. As the summer was about to come—but it never did come—he thought the capabilities of the machines should be proved, if for no other reason, to save the continental and colonial companies from ruin. Every way was tried; but the company was so unfortunate as to have officials who did not come up to expectation. When they got their machines into good positions, with honest treatment and moderately fine weather, £1 or £2 a week was made, yet they were losing by it. He thought, however, that anyone taking up the machine, with respectable people willing to hire it, might, under good circumstances, get a glorious return. The chemicals of the plaques formed part of the secret of the patent; and when the plaques failed to produce the result expected, and were returned by the thousand, they should be examined by an expert, but he was told that that would be suicidal, as it would reveal the company's patent to a rival photographer. In his opinion, it was not a hopeless affair if worked under more auspicious circumstances. Sir James Carmichael said the management of the company had been deplorable, and it had been proved that it was impossible to work the present machines at a profit. They had been worked hitherto at an enormous loss. He believed in the invention and patents; but the company had not the money to carry out the suggested improvements that might make it a success. These machines only produced £1 a week, and it would take £4 a week to clear them. The idea of letting the machines at £1 a week was out of the question. Mr. Dalton Miller contended that it would be the worst thing in the world to wind up the company, for then their patents would be sold for an old song. In the end, a motion by Mr. Dalton Miller against winding up the company was put to the vote, and declared carried, but a poll was demanded.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Paramidophenol and Bromide Paper—Celluloid Solution—An Alkaline Fixing Bath—Transferring Collodio-Chloride Prints to Artificial Ivory.

*Paramidophenol and Bromide Paper.*—In Dr. Stolze's opinion, the paramidophenol developer is far superior to any other developer recommended for bromide paper. He states that the developing solution prepared according to the formula given by Dr. Andresen—

| | |
|---|---|
| Water ... ... ... ... | 1,000 c.c. |
| Hydrochloric paramidophenol ... | 5 grammes |
| Sodium sulphite ... ... ... | 50 ,, |
| Carbonate of potash ... ... | 25 ,, |

though it contains but 5 parts of the reducing agent to 1,000 parts of water, not only acts much quicker than eikonogen, hydroquinone, or ferrous oxalate, but that it may even be diluted as much as 5 to 2,000 in the case of large prints if it is desired to control the development. If the quantity of the alkali is increased considerably—about from 25 to 30 per cent.—prints will be obtained of unsurpassed clearness of the whites and velvety black shadows, together with perfect softness of the half-tones. Moreover, this brilliancy will be preserved after the prints have dried. "These prints are leaving behind them everything which I have hitherto seen on bromide paper," says Dr. Stolze. He then points out that the second formula given by Dr. Andresen offers the possibility of obtaining a ready-prepared developer of highest concentration. The formula runs as follows:—

| | |
|---|---|
| Boiling water ... ... ... ... | 100 c.c. |
| Potassium meta-bisulphite ... ... | 30 grammes |

When dissolved, add—

| | |
|---|---|
| Hydrochloric paramidophenol... ... | 10 grammes |

To a quantity of this well-keeping solution a concentrated solutiou of caustic soda is added by stirriug, until the precipitate formed is just redissolved. For use, this stock solution may be diluted with fifty times its bulk of water, so that a stock solution consisting of 100 c.c. will be sufficient to obtain more than 5,000 c.c. of ready-prepared developer. In this direction paramidophenol is far superior to eikonogen, and especially to ferrous oxalate, with which it is not possible to prepare as highly concentrated developers.

*Celluloid Solution.*—Spoiled celluloid films may be used, according to the *Phot. Notizen*, in the following way. They are soaked in soda solution, and freed from the gelatine layer; then they are dissolved in fifty times their bulk of amyl-acetate. With the celluloid solution thus obtained, negatives may be coated; after the lapse of some days, the coating will be as hard as ivory. In the same manner, three or four per cent. solutions of celluloid may be prepared and stained with coralline, fuchsine, tropacoline, &c. If glass plates are coated carefully with this solution, and, after draiuing, re-coated, hard films are obtained on which gelatino-chloride prints may be squeezed, or which may be stripped off the glass support. The celluloid solution may further be used to coat dishes, dark slides, &c., since the layer thus obtained is not affected by acids, alkalies, and alcohol.

*An Alkaline Fixing Bath.*—The following fixing bath is recommended by B. Kröhnke. Two parts of alum are dissolved in ten parts of hot water, and, on the other hand, one part of caustic soda in ten parts of hot water. The two solutions are mixed together by pouring the alum solution gradually into the soda solution. An almost clear liquid is obtained, which, after cooling down, should be filtered and kept for use in a well-stoppered bottle. Of this alkaline alum solution such a quantity is added to the ordinary hyposulphite of soda solution as will be required to clear aud harden the film of the negative. The latter is placed in the bath without being previously rinsed. One or two parts of the alum solution to 100 parts of the hypo solution will generally be sufficient; more may, however, be added without fear of injuring the negative, in the case of a badly-discoloured developer having been used, or if a very hard film is required. This alkaline fixing bath has the advantage that it does not attack the negative film, even after it has acted upon it for hours; on the other hand, it clears and hardens the film just as thoroughly as the acid fixing bath. The alkaline alum-soda solution keeps indefinitely if it is stored in a well-stoppered bottle, and mixes with the hypo solution without producing muddiness.

*Transferring Collodio-Chloride Prints to Artificial Ivory.*—The following method is recommended by Bruno Risse. A well polished plate glass is rubbed, by means of a pad of linen, with a solution of 1 part of white wax in 100 parts of ether. The print to be trausferred—having been produced on collodion stripping paper—should be about half-an-inch larger in all directions than the glass plate which is employed for stripping. The collodion paper is placed in warm water, in which the film will leave its paper support. After the film has been caught on the glass plate, its edges haviug been turned down, the glass plate is bordered all round with strips of gummed paper, so that if the latter is turned up, the plate, together with the paper strips, will form a dish of about half-an-inch in depth. The inner sides of the gummed paper forming the dish are coated with a paste consisting of 1 part of stearine and 5 parts of hog-fat, iu order to facilitate the subsequent strippiug. The ivory mass is prepared by dissolving 150 grammes of gelatine in 600 c.c. of warm water, straining this solutiou, whilst still warm, through flannel, and stirring into it 30 grammes of zinc-white and 15 grammes of glycerine. The mixture should be kept warm for one hour on the water-bath, that the air-bubbles may be gathered on its surface. They may either be skimmed with a spoon, or the mass is allowed to set, and, after having cut off its surface, it is again liquefied by warming in hot water. The solution is then poured about one-fifth of an inch high into the above-mentioned improvised dish upon the print, taking care that no air-bubbles are produced. After setting, the mass is dried out by a temperature of from 25° to 30° C. Before stripping the print off the glass plate, the horny film is coated with a solutiou of 2 parts of gutta-percha in 100 parts of chloroform. After the strips of gummed paper have been cut off, the print may be easily stripped off the glass plate by passing a knife beneath it.

---

Enamelling Albumen Prints.—According to the *Photographische Archiv*, a highly glossy surface may be imparted to albumen prints without the use of gelatine in the following way. Equal parts of ox-gall and of alcohol are mixed, and the mixture is allowed to stand for several days with occasional violent shaking. A glass plate is coated with it evenly, and the albumen print, as it comes off the washing water, is placed on it, and allowed to remain on it for about one hour under pressure. As soon as it is dry it will come off with a beautifully glossy surface.

## Notes.

The prosecution of a man who sought to add to his scanty income by the fabrication of bank notes, revives a question which has occurred to us more than once: Are not the present notes issued by the Bank of England too apt to tempt the forger? The spurious note which led, in the present case, to detection of the delinquent was a photograph, and the only part of it which did not appear to be genuine was the paper upon which it was printed. The photographic knowledge possessed by the fabricator did not, apparently, extend to an imitation of the watermark; but, as is known, such an imitation by photographic process is by no means an impossibility.

Some persons there are who are always crying out for cheaper dry plates. We wonder if these frugal ones have ever tried to make plates for themselves, and have noted the bare cost of turning out a few dozens, to say nothing of the care and labour expended upon the work. For our part, we wonder that such excellent plates as are now to be obtained can be produced at the low price asked for them. To show how prices have been cut down, it is merely necessary to refer to the price which photographers in the old wet-plate days had to pay for the glass alone. Half-plate glasses were commonly sold at 28s. per gross, or one shilling more than is now asked for a gross of dry plates ready for use. The modern photographer may thus be said to get his gelatine, silver, and his plates prepared for him free of cost, besides paying less for glass than the last generation of photographers were in the habit of doing. Of course, the glass used for wet plates was of finer quality than that necessary for the gelatine process, but all the same the figures given are significant.

The Messrs. Lumière, the originators of the paramidophenol developer, have, it is said, at last conquered one of the chief difficulties with which they had at first to contend in dealing with the new product, namely, that of obtaining it in sufficiently strong solution. They can now prepare it at a strength of fourteen per cent. (presumably by the addition of some body which promotes solution, but is otherwise inert), and at this strength a developer of great power is produced. Paramidophenol is still costly, but, as one dose of developer will serve for about fifty plates, it is not so expensive as it seems to be.

One of the "Notes" in our issue of October 23rd last described Gustave Doré's stratagem for dispersing the persistent gazers who stood in the way of his friend's camera in the streets of Verona. A correspondent tells us he has a very practical and successful, if less dramatic, plan of "clearing the course," and eliminating obstinate obstructionists from the view or site he wishes to photograph. He carries, as every photographer should do, a screw clamp and a rule, and when he has focussed he clamps the latter to one of the legs of the tripod, adjusting it against the side and near the end of the base-board. He then swings the camera round to quite another direction, and when in this position inserts diaphragm and dark slide. By this time the idlers have taken up a new position in front of the lens. The camera is now quietly turned back again to its original position in contact with the clamped rule (or wire, or stick), and the exposure made before the foreground is again obstructed.

The art of sending pictures by telegraph has long been the dream of many, and all kinds of devices have been produced—on paper—by which the difficulty is alleged to have been conquered. This subject, indeed, like polychromatic photography, is one of the most fascinating of modern scientific will-o'-the-wisps. Most of the methods proposed are plagiarisms of Bain's telegraph, or they depend in some manner upon variations in electrical currents caused by the action of light on selenium. The method proposed by Amstutz, an account of which we print on another page, is decidedly clever in conception, but we fancy that practical electricians, as well as engravers, will see many rocks ahead which will have to be steered clear of before this ship can be brought into harbour.

An instructive case, both for photographers and sitters, came before the judge of the Westminster County Court last week. The plaintiff, a photographer, sued the defendant, Viscount Maitland, for £7 8s., the value of photographs supplied under the following circumstances. A Captain Sleigh conceived the idea of publishing an album of all the ladies presented at Court in 1889 and 1890, and for this purpose photographs were necessary. Viscountess Maitland, among others, sat to the plaintiff, and proofs forwarded to her, being an exception to an arrangement made with Captain Sleigh, that proofs were not to be sent to any of the sitters. The plaintiff was aware of the object Captain Sleigh had in view, and it may be presumed that it was at the request of Lady Maitland proofs were sent to her. At all events, it does not appear, from the report of the case, that Captain Sleigh gave instructions to that effect, and when the photographs were not returned, the plaintiff sued Viscount Maitland for the money. Lord Maitland's defence was that the photographs were taken upon the understanding that no charge was to be made, and the proofs were not returned because they were not good, and he thought they were valueless; and ultimately the judge held that the photographs were to be taken for the album free of charge to the defendant, and gave judgment for the latter.

The case is an example of a complication which very frequently arises when an order is given by one person for another person to be photographed. The distinction is not sufficiently borne in mind by the photographer, who sometimes has a notion that a sitter *qua* sitter is liable in the event of any hitch in the original agreement. These triangular arrangements are exceedingly liable to break down, and hence the necessity for the precise terms to be clearly stated in writing.

The defence in the action is very typical of the indifference sitters, as a rule, show in regard to proofs. Viscount Maitland thought that because he or his wife did not like the photographs, they were therefore valueless. They quite forgot that the time and expense incurred are just the same with the production of unapproved photographs as with those which are approved. This unreasonable view is far too common, and every photographer has had the disagreeable experience of taking a vast deal of trouble over sitters, of sending proofs, and of hearing no more of the matter. Some photographers adopt the precaution of stating on the wrapper that when proofs are not returned they are always charged; while others send untoned and unfixed prints. The former plan is preferable.

## THE PALL MALL EXHIBITION.

ALTHOUGH this Exhibition has now been opened for some weeks, it still continues to attract a number of visitors, and we understand that the evening lantern slide entertainments are well attended and fully appreciated.

Continuing our review of the pictures, we notice a charming little photograph by Mr. E. M. Stone (No. 345), "A View of Abingdon." We happen to know this part of the Thames pretty well, and think that Mr. Stone would have done better if he had taken his view from a lower point of the river. As it is, he has chosen a point from which a tree somewhat dwarfs the church spire, which, of course, should be the principal object in the picture.

Mr. W. P. Marsh has often exhibited fine seascapes, but never has he shown a better one than that here exhibited with the title "Where the Billows Roar" (No. 358). The photograph well shows that creamy churning up of the water which is such a beautiful feature of breaking waves; and another good effect is caught in the blowing from the tops of the breakers of the water-dust.

No. 361, by Mr. R. Terras, illustrates a line of Burns—"What can a Lassie do wi' an Auld Man"—and it is by far the best picture of the three which this gentleman contributes to the Gallery; but the other two, "The Engagement Ring" and "Preparing Dinner," are by no means poor pictures, although they are over-shadowed by the one just named, where the story is so well told, and so true to nature.

No. 366, under the title of "Jetsam," is an attractive picture by Mr. C. H. Cook, and represents a boy lying prone on the grass amid a heap of old anchors and chains, such as one can often see at busy seaports.

Nos. 367 and 368 are two capital landscapes by Mr. F. Cobb, the first one being a quiet rustic scene, and the second interesting because it gives a glimpse—and a very good glimpse—of that old world Sussex town called Rye. Another picture by this gentleman—No. 369, "A Thirsty Soul"—introduces us to a pond with a most remarkable horse drinking from it; the poor old thing looks as if his next journey should be in the direction of the knacker's.

One of Mr. W. J. Byrne's best pictures is hung on this wall—No. 374, "Buy a Broom!" This is a large photograph; a full-length figure of a child taken direct, and a child who is woe-begone enough to act up to the character which she represents.

Mr. H. Young, in No. 388, gives us a fine piece of landscape work, with a distant sunlit hill very beautifully rendered. The picture, perhaps, would have been better if it had some object in the foreground by way of balance; but it shows work of a very high order.

The two views by Mr. W. Atkinson, which are hung close by No. 385, are bromide enlargements, and they have certainly suffered in the process of magnification.

No. 382 is a frame containing three pictures by Mr. E. D. Stern, with the strange title "Sicilian Tid-Bits." The most curious of the three is a picture of a cart containing thirteen women and nearly as many babies, drawn by one unfortunate horse. Another shows two horned beasts dragging a heavy stone roller; and the third is a donkey-cart, about which there is nothing very remarkable. But the pictures are interesting in giving us a peep of peasant life in Sicily.

In Nos. 399 and 401, Mr. Cobb gives us some more of his excellent rustic scenes, which are taken with the careful hand of a skilled photographer. No. 401 especially is a pleasing picture, and owes its principal charm to the circumstance that it is taken in the face of the sun. The same effect is noticeable in the pretty little picture close by—No. 412, by Miss Roche. This lady sends several pleasing works, but this is the best. It represents an old man in a garden against a mass of well-lighted foliage; the picture is full of sunshine.

No. 410 is a frame of excellent portraits of children by Mr. E. Resta. These are platinotypes, very natural in pose, and, like most children's portraits under such conditions, are pleasing to the beholder. The same gentleman has another frame of similar portraits (No. 417) which deserve equal praise.

Col. Noverre sends three pictures on rough drawing-paper, a method of printing which he has, in past exhibitions, done so much to popularise. The best of the three is No. 406, "An Evening in Mount's Bay, Cornwall." The subject is simple enough, a ship lying at anchor in the beautiful bay, with a mass of rock on one side, the whole being relieved by a very fine sky effect.

Mr. H. Baker, of New Street, Birmingham, must be congratulated upon his frame of portraits in sepia. These are in carbon, and Mr. Baker has been most fortunate in attracting to his studio a number of young ladies who make remarkably pretty pictures.

No. 420, by Mr. A. J. Irvine, is a frame of five very excellent Norwegian pictures.

Mr. Paul Lange sends a little picture entitled "A Misty Morning at Chirk Canal." This picture is taken from the towing path, and the principal object is a barge being towed along by a horse and boy, all being overshadowed by a mass of greenery.

Mr. Warneuke, of Glasgow, has been fortunate enough to secure one of the medals for a very beautiful picture of Miss Laura Johnson as "Desdemona"; and the same gentleman, still harping on Shakespearean subjects, contributes a couple of very beautiful pictures of "Othello" and "Hamlet," as interpreted by the eminent actor, Mr. Herman Vezin.

Mr. H. Symonds sends some of his exquisite yacht pictures; the three shown on the wall, namely, "The White Slave," "A Reverie," and "The Neptune," being beautiful examples of modern photography. We can only say that they could not be improved upon.

Some portraits of the "At Home" type are sent in by Messrs. J. Russell and Sons, in frame No. 431. Among these are portraits of the Empress of Germany, the Duchess of Marlboro', and the Princess Victoria of Teck. These pictures are in every sense worthy of the name of the firm mentioned.

No. 432 is an enlargement from a negative by Mr. J. W. Lindt, produced by the Autotype Company. It will be remembered that Mr. Lindt exhibited several pictures of the same kind at a previous exhibition; this particular one represents a group of natives from the New Hebrides. Such pictures have a great value from an ethnographical point of view, and the authorities of the British Museum have not been slow to recognise this, for several pictures by Mr. Lindt are now on permanent exhibition in the galleries at Bloomsbury.

Some more studies of children are shown in frame No. 433, by Mr. W. J. Byrne; some of these being as charming as it is possible to imagine. Mr. Byrne seems to have the secret of winning the confidence of his little models, for their portraits are perfectly natural, and they appear unconscious of the presence of a camera.

"A Break in the Clouds" is the title of a picture by Mr. L. C. Bennett. We recognise the photograph as having been taken on the beach at Hastings from the neighbourhood of the East Hill; the atmospheric effect which gives the picture its title is very fine.

It is not an easy thing to illustrate by photography a comedy, but Mr. H. Salisbury has succeeded very well in extracting a story, which he calls "Sin and the Sinner," from two models, a dog and a child. As far as we can follow the argument of this history, both dog and child are tempted to steal from the sugar basin in front of them, and in the end both fall and suffer remorse. Perhaps the series might have been better called "A Struggle for a Piece of Sugar, in seven tableaux."

A very fine portrait of the Marquis of Salisbury, which, we learn from the catalogue, was taken "at home," must again be credited to Messrs. Russell. In this case the original portrait has been enlarged in carbon.

Mr. Seymour Conway contributes a picture which we regard as the finest piece of landscape in the room. It is a view of the Trossachs and Ben Venue; the crispness of the foliage, and the detail on the distant mountain, are quite remarkable. There are many such beautiful scenes to be found in this lovely neighbourhood, but most tourists hurry through on the top of a coach, and miss them altogether. Mr. Seymour Conway has evidently been wiser than this, and has succeeded in discovering a spot from which a very beautiful picture has been obtained. The work is that of a man who evidently has a thorough mastery over all his materials. Another picture by the same hand, which is full of merit, but not quite so attractive, is No. 483, "Kilchurn Castle," on Loch Awe.

Mr. Bhedwar, of Bombay, sends a number of pictures which are well worth attention. They include a capital portrait of the Duke of Edinburgh, and some Oriental scenes which are clever. One of these represents a woman playing with a parrot, whilst a jealous macaw stands on a stool at one side. The title of this picture is "Two's Company."

A direct portrait of the musician Paderewski, the work of the London Stereoscopic Company, attracts attention, and is fully up to the standard which we have learned to expect from this firm.

We have now arrived at a corner of the Gallery where it has been the custom from time immemorial to hang pictures which are due to mechanical processes, and here are three excellent works of this kind sent by the Autotype Company (No. 508) from direct negatives by A. E. Coe. These pictures are on toned etching paper, and are portraits of civic authorities at Norwich. The work is perfect of its kind. We also have here some fine interiors taken by magnesium flash-light by Mr. J. Stewart; these are so soft in quality that one can hardly believe that they are taken by artificial light, which is too often associated with chalk and soot results. An immense photogravure, "The Syrens," by Mr. F. Hanfstaengl, hangs here, and is quite a triumph of photographic work of this kind.

Some dry-point pictures by Mr. F. Flather attract attention from their good quality, and we must not omit to notice a collection of rare and curious eggs photographed by Mr. H. Stevens. We need hardly say that the egg of the great auk is here; and it will perhaps be in the memory of our readers that Mr. Stevens was instrumental in selling one of these whited sepulchres a few months ago for about £250.

The Autotype Co. have won a medal for a very beautiful auto-gravure from a painting in last year's Royal Academy, entitled "Outward Bound." It would be difficult to imagine a more perfect copy of an oil painting than is represented by this picture.

The Survey Department of India exhibit, in the frames Nos. 522 and 524, some very beautiful photo-etchings, the first of which are some architectural examples from the Government Architectural Survey of Western India; but perhaps the greater interest attaches to the next frame, in which we are able to compare the ordinary method of photo-etching from drawings with the thiocarbamide direct method introduced by Colonel Waterhouse, which has already received notice in our columns. The other frame represents various examples of photo-etching, which are remarkable for the fineness of the results shown.

We must reserve for future notice the pictures hanging upon the screens, and the apparatus exhibited on the centre table, together with the lantern slides.

## A NEW PROCESS FOR SENDING PHOTOGRAPHS BY WIRE.

Noah S. Amstutz, of Cleveland, the inventor of the process for transmitting pictures by electricity, says the *Chicago Herald*, is a little man, with a full beard, and wearing iron-bound spectacles. For six long years he has followed his pet idea, until now he feels certain that complete success is about to crown his efforts. Mr. Amstutz's invention is not the first in this line, but none of the others have gone much beyond the visionary stage. He seems to have learnt the secret which other inventors sought for in vain. Change is the one word which explains it all. Variation is the better word, for he has learned how to reproduce a variable surface by means of a variable current of electricity, and that discovery is the key to his success. All electricians—and everybody else, for that matter—know that the pressing down of a telegraph key in Cleveland will cause the armature of a sounder in New York or Chicago to click, but it requires only a steady current of electricity to produce that result, and the armature of the sounder moves with each click the full distance allowed to it within prescribed limits. Put into the wires a variable current which will cause an armature to move much or little, to flutter or dance at the will of the operator, and you have solved the problem on which Mr. Amstutz has worked for years, and which he has mastered at last. The machine or apparatus on which Mr. Amstutz has laboured so long is apparently a very simple mechanical electrical device. It consists of a metal frame-work about a foot square, and much like the frame of a type-writer, which supports a brass cylinder three inches in diameter and about eight inches in length. Above this cylinder is a metal vibrator attached to a carriage, which at the back is fed transversely by a feed-screw. The front end of the carriage travels on one of the bars of the frame as the carriage is moved slowly by the feed-screw from right to left across the top of the cylinder. Attached to the carriage where the feed-screw passes through it are the wires carrying the electric current. Extending along the lower side of this carriage is the delicate vibrator referred to above, to one end of which, and directly over the brass cylinder, is a tracer that can be raised or lowered by means of a set-screw. Suspended over the other end of the vibrator are seven little platinum contacts, against which the vibrator presses as it rises, making connection with the resistances which give variation to the electric current. An electric motor is used to turn the cylinder and feed-screw. The process of transmitting the picture seems simpler than the apparatus by which it is done.

From a photographic negative a gelatine print is made (being a stripping film). This print has a variable surface, the plain surfaces being white, and the various elevations showing greater degrees of shade as they increase in height. The gelatine print, for convenience, is mounted on a strip of celluloid, which is passed around the brass cylinder, and by means of screws is drawn tightly into place, the picture lying around the cylinder with its face up. When everything is in place, the tracer attached to the vibrator is so adjusted that its point will run smoothly over the lowest surface of the picture, the electric motor is started, and the cylinder begins to move. It revolves about twenty times each minute.

The picture passes under the tracer, which, dancing over the variable surface, raises and lowers the vibrator, constantly changing, though not entirely breaking, the electric current by which the picture is being sent. The feed-screw turns very slowly, and the cylinder bearing the picture makes about eighty revolutions while the tracer is moving transversely over an inch of the space along the top of the cylinder. In other words, the tracer passes eighty times from top to bottom of the picture in a space an inch wide, touching every particle of the surface within that space, and giving to the electric current all the variations of light and shade as represented by the variable depressions and elevations in the gelatine print. The fineness or coarseness of the work of the apparatus is regulated entirely by different sets of gears. At the other end of the wire is the receiving cylinder, which is exactly synchronised with the one from which the picture is sent, so that the revolutions are the same. On the receiving cylinder, which fits into a metal frame like the other, is a thin sheet of paraffin wax. Adjusted over this sheet of wax is a V-shaped "graver," or little steel point attached to a carriage which works on a feed-screw similar to that used on the sending cylinder. The current coming over the wires passes through the magnets, having variations corresponding to the variations of light and shade of the photograph being sent. As soon as the electricity is applied at the sending end and the cylinder there is started, the receiving cylinder also begins to move. As the tracer moves up and down over the variable surface of the gelatine film, so the "graver" on the receiving cylinder rises and falls, cutting into the sheet wax, and reproducing in exact detail the variations of light and shade in the picture on the sending cylinder miles away. When the sending of the photograph has been finished, there is on the wax an exact reproduction of the picture in relief lines, varying in width and depth with the light and shade of the gelatine film from which it was sent. The sheet of wax is then taken from the cylinder, warmed slightly, and pressed out flat. From its surface can be printed proofs of the picture, or from the wax engraving—for that is what it really is—can be made a plaster mould from which a type metal can be cast. The time elapsing between the turning on of the electricity for the sending of a picture two inches square, and the casting of the cut, ought not to be more than twenty-five minutes. The time will, of course, vary with the size of the subject.

Sketches made in half-tone, with variations in light and shade (not simply outline), those approaching the style of an India ink wood-drawing, &c., can be so made under the process that, as soon as completed, they may be placed upon the cylinder of the transmitter and automatically sent to a distance, and there made into an engraving which is the reproduction itself. This step will enable a special correspondent to send his sketches so as to reach the home office as soon as any press despatches. It will no doubt be understood that the result arrived at is the correct reproduction of the photograph, with all its variations of light and shade; hence its accuracy. The engraving is a special feature of the device. While the result will have an appearance similar to the well-known half-tone engraving, it will not, however, have any of the disadvantages of this process when used for regular newspaper work, namely, the filling up of the lines because of their shallowness, and the ultimate breaking down of them because of their not being strong enough to sustain the heavy pressure of the large cylinder presses. The cutting is done by an electrical-mechanical device, which can be adjusted so as to go a greater or less depth without destroying the fineness of the work. With chemicals this is impossible. A modified receiver is also used, in which the carriage is the same as the one described above, but the support for the material upon which the record is to be made is different, being a reciprocal table having a block of soft metal instead of the cylinder and its sheet of wax. The manner of cutting is different also, because on the metal a rotary cutter is used instead of the V-shaped graver used on the wax. When the engraving is completed in the metal, proofs can be taken direct, or the block can be stereotyped by the ordinary methods, and at once placed in the forms and on the press for printing.

Mr. Amstutz has made several tests of the apparatus, all in private. The first was made on March 27th, 1891, and the last on 17th of July. He chose for his first subject a picture showing a house interior with three persons sitting at a table. There was too much detail in this picture for good work as a first attempt. The next subject was a photograph of Carmencita, the Spanish dancer, whose dress, covered with lace and embroidery, made a difficult surface to work upon. The result was a very good likeness. The last test was upon a photograph of himself, and the result showed decided improvement over the previous tests. The main obstacle now to be overcome is the adjustment of instruments, which must be exact to a hair's breadth. The principle has been conquered, and it is only a question of time when the mechanical difficulties will be overcome.

Aberdeenshire Amateur Photographic Society.—We are apprised of the formation of the above Society, which holds its meetings on the last Tuesday of each month at 8 p.m. The membership subscription is 2s. 6d. per annum.

Photography and Disease.—The latest application of photography to medical science is to use it as a means of locating tumours on the brain. The theory is that spasms are caused by affections of the nervous centres, and that the disturbance of a centre is invariably followed by identically similar contortions of the muscles. A tumour must, of necessity, press upon a nerve centre, producing violent spasmodic attacks. While in this condition the patient is photographed, and the exact position of the tumour discovered. Experiments have been successfully made in San Francisco by an "eminent local surgeon." We must confess we do not follow the reasoning which attributes spasmodic attacks to tumours on the brain. Why not to a tumour on any other part of the body? There seems to be something wanting in the explanation of the theory.—*Science Siftings.*

## APPARATUS FOR MAKING SATURATED SOLUTIONS.

THE following apparatus, which is described in a recent number of a French journal (*Bulletin de la Société Francaise de Photographie*), will be interesting to those who have much to do with saturated solutions, and will be eminently valuable to workers with the ferrous oxalate developer.

This apparatus, described by M. Davanne in his treatise on "Photographic Chemistry," and put in practice by M. F. Carpentier in his laboratory, consists of a glass vessel holding about a quart, having a tubulure in the lower portion, and furnished in the upper portion with a large mouth, in which fits the ground tube of a sort of funnel, also of glass, in which is placed the substance to be dissolved. This funnel, which is hemispherical in shape, may be closed by a plate of glass resting on the ground edges, and which prevents evaporation and the introduction of dust. The mouth of the funnel is closed by a cork, in which is introduced two straight tubes. One of these tubes starts from the top of a funnel, and stops at a distance of a few centimetres below the cork; the other commences above the cork, and descends almost to the bottom of the vessel. On the lower tubulure is affixed a rubber tube to which is adapted a screw clamp, forming a tap.

To make use of this appliance, after having placed in the funnel a quantity of the substance to be dissolved, sufficient to furnish a concentrated solution which can fill the vessel, pour at one time the dissolving liquid, water, or other substance, in sufficient quantity to completely fill the vessel and the funnel surmounting it. We have now only to wait the necessary time for the solution to go on automatically, the concentrated portions falling gradually to the bottom of the vessel. In fact, the portions first dissolved descend by the lower tube to the bottom of the vessel and drive back the less dense liquid, which, rising through the upper tube, finds its way to the upper portion of the funnel. In this manner is established a continuous current, by means of which the less dense portions of the liquid are constantly brought in the upper portion in contact with the undissolved salt. They then become loaded with this salt, and in the concentrated form fall to the bottom of the vessel, on top of the solution already formed, whose level will be seen to gradually rise until the vessel is entirely filled. By loosening the clamp on the rubber tube the concentrated solution is withdrawn at will, and it suffices, to replace the quantity used, to add more liquid to the funnel, and renew, when necessary, the stock of salt in this last. The use of the rubber tube adapted to the vessels prevents it being disturbed when the liquid is to be drawn out. In this way it is possible to keep on the same shelf a series of vessels always ready containing all the concentrated solutions which may be wanted in the laboratory, and these solutions, which are thus prepared automatically, without loss of time or special manipulation, may be kept indefinitely protected from dust and evaporation.

ROYAL INSTITUTION OF GREAT BRITAIN.— At the general monthly meeting on Monday, November 2nd, Sir James Crichton Browne, M.D., LL.D., F.R.S., Treasurer and Vice-President, in the chair, the following were elected members: — George Frederick Deacon, M.Inst. C.E., Miss Henriette Hertz, Arthur Walter Mills, Robert Mond, B.A., F.R.S.E., Joseph Shaw, D. Hack Tuke, M.D., F.R.C.P., Lieut.-Col. H. S. S. Watkin, C.B., R.A., William Henry White, C.B., F.R.S., M.Inst. C.E.

## ANNUAL WINTER EXHIBITION OF OIL PAINTINGS AT THOMAS MACLEAN'S GALLERY.

A COLLECTION of between fifty and sixty oil paintings by artists of British and foreign schools is now on view at this well-known gallery in the Haymarket, and is well worth a visit. Taking the landscapes first, we may mention a very fine one by Mr. J. Horrock, "Carting Hay near Guildford"; and another picture of a similar subject by Mr. Wimperis. The last-named gentleman exhibits two or three other pictures, which are full of beauty. The collection includes a picture by Rosa Bonheur, representing a group of deer under trees in the forest of Fontainebleau; and Mr. Peter Graham, R.A., in "A Passing Shower," gives us one of his well-known Highland scenes, with rough-coated cattle. Mr. L. B. Hart seems to be following in the footsteps of the artist last named, and the titles of his pictures—"A Highland Drove, Perthshire," and "After Rain," another Scottish scene "—would almost seem to indicate that he has gone over the same ground; but we must say, at the same time, that the imitation—if it be imitation—is, in this case, good. We must not omit to mention a very clever little bit of landscape by Mr. Clayton Adams, entitled "A Sandpit in Surrey." In this work the contrast between the red sand and the purple heather growing on the margin of the hollow is very beautifully rendered.

Among the figure subjects, we notice a charming little picture by Mr. Burton Barber, entitled, "Cupboard Love," in which a young girl is holding a basket behind her and tantalising an eager little dog who is waiting to be fed. "The Lace Maker's Courtship," by Mr. Stefano Novo, is a charming little picture representing a man pleading his cause to a peasant girl, who is leaning against a table with her face averted, smiling at his impetuous words. A similar subject by the same artist, entitled, "A Happy Moment," also forms a very attractive picture. There are other pictures in this gallery of real merit, and we regret that lack of space forbids us to notice them more in detail.

## PHOTOGRAPHIC EXHIBITION AT LEYTONSTONE.

AN exhibition of photographs is in course of preparation at the Fillebrook Lecture Hall, Leytonstone, Essex, under the presidency of G. Andrew Hutchison, Esq. The exhibition will open on Wednesday, Dec. 2nd, 1891. Six silver medals will be awarded for the best photographs sent in for competition, subject to the following conditions:—

1. Amateurs only may compete.

2. The whole production of the picture, including exposure, development, retouching (which must be declared), printing, toning, and mounting, must be solely the work of the exhibitor.

3. Photographs may be by any process, and any number may be entered, excepting such as have already gained awards in any open exhibition or competition.

4. There will be the following classes:—(1) Direct prints; (2) enlargements; (3) lantern slides, in sets of not less than four.

5. All photographs must be mounted, and, if possible, framed. (The mounting and general finish will be taken into consideration in making awards.)

6. An entrance fee of one shilling will be charged to each exhibitor entering pictures for competition, who must fill up a printed form and send it (accompanied by

the entrance fee) as soon as convenient, but not later than Tuesday, Nov. 17th, to the Secretary, who will in return send labels to be fixed on the backs of exhibits (in classes 1 and 2), or on boxes containing slides (in Class 3).

7. Exhibits sent by carrier should be addressed to Mr. J. W. Spurgeon, Fillebrook Lecture Hall, Leytonstone, London, N.E., and may be sent as early as convenient, but must be received not later than Tuesday, November 24th, on which day photographs may be brought to the Hall, from 8 till 10 p.m. All expenses of packing, and carriage both ways, must be paid by exhibitors; pictures brought by hand must be taken away on Tuesday, December 8th, between 8 and 10 p.m.

The Committee will also be pleased to receive for exhibition photographs not for competition, including those which have gained awards elsewhere. For exhibits in this section no entrance fee will be charged. Both amateurs and professionals are invited to contribute, subject only to rules 5 and 7. Forms and all particulars may be obtained of Joseph W. Spurgeon, Hon. Sec., 1, Drayton Villas, Leytonstone, Essex.

## Reviews.

In Scripture Lands. By Edward L. Wilson. *(The Religious Tract Society, London.)*

The photographic interest attaching to this handsome volume is two-fold. In the first place, it is by our esteemed confrère, Dr. Wilson, who is well-known as a writer on photographic matters, besides being the editor of the Transatlantic magazine which bears his name; and in the second, the book is illustrated with one hundred and fifty exquisite woodcuts and process blocks from the author's photographs. A good deal of the subject matter will be familiar to English readers, from it having already appeared in serial form in *Scribner's Magazine*, and those who have, in that way, had their appetites whetted by the perusal of part of Dr. Wilson's text, will be anxious to secure the complete work in the form in which it is now presented. Dr. Wilson's powers of picturesque description give a great charm to the work, and one feels, in reading his words, that they are the outcome of a personal acquaintance with the scenes so well painted. The pictures themselves constantly call to mind those in Roberts's "Holy Land," which were drawn long before the camera was available for such work, and it is curious to note how the modern photographs corroborate the pencillings of that distinguished artist. Dr. Wilson's volume will be indispensable to students of Bible history, while it will always serve as a model for anyone who has it in contemplation to illustrate a book by photography.

Photographic Club.—Subject for November 11th, "Impurities in Photographic Chemicals," Mr. A. M. Levy. The annual dinner will be held on the 18th.

Fry Manufacturing Company's Demonstrations. — The second of this series was given on Friday last. The subject, "Bromide Enlarging," was dealt with in a practical manner, the lecturer describing the apparatus required and the method of using it, afterwards illustrating his observations by producing enlargements by artificial light. Details of development were given, and suggestions to meet possible failures. The lecture was followed by a general discussion and questions from the audience. During the evening Griffith's fixed focus enlarging apparatus was shown and used. The next lecture, on the subject of "Lantern Slides," is fixed for Friday, Nov. 13th. Tickets in return for stamped directed envelope.

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

17,860. Ladislas Nievsky, 14, Gransden Road, Shepherd's Bush, London, "Aspirator Tank for Developing, Fixing, and Washing of Photographic Dry Plates in a broad daylight and in the same vessel, without touching liquids during those operations."—*October 19th.*

17,967. George Bagnall Bradshaw, 37, Chancery Lane, London, "Improvements in Photography."—*October 20th.*

18,034. David Allan, 157, Whitfield Street, St. Pancras, London, "Improvements in Magnesium Flash-Lamps for Photographic Purposes."—*October 21st.*

18,219. William Phillips Thomson, 6, Lord Street, Liverpool, "New or Improved Paper for Making Transfer Pictures from Photographs." (The firm of Fahn and Schwarz, Germany.) —*October 23rd.*

18,332. Edward Marlow, 12, Cherry Street, Birmingham, "Improvements in Photographic Vignetting Glasses."—*October 24th.*

### Specifications Published.

19,274. *Nov. 26th*, 1890.—"Regulating Shutters for Photographic Cameras." A. S. Newman, 71, Farringdon Road, London, E.C.

This invention consists in regulating the speed of the movement of the shutter by means of pneumatic cylinder and piston. The piston rod is connected to some working part of the shutter slide, or to some part of the apparatus connected therewith, in any suitable manner, such as in the manner of connecting up the variable expansion or valve gear of a steam engine, in which, by moving the regulating gear, the length of travel of the valve upon the steam parts of the engine is varied; that is, in this invention the length of movement of the piston itself is thus increased or diminished, and thus regulates the speed of the shutter, and so regulates the time of exposure. Similar results can be obtained by mounting the cylinder on a slide, swivel, or joint, and varying its position with relation to some working part of the shutter.

19,480. *November 29th*, 1890.—"Shutters for Photographic Cameras." A. S. Newman, 71, Farringdon Road, and A. L. Adams, 81, Aldersgate Street, London, E.C.

Relates to a shutter for "detective" or hand-cameras which, after each exposure, will return to its normal position for giving the next exposure without admitting any light whilst so returning. A thin plate of metal having a slot cut therein, and being of quadrant shape, is mounted to turn on a pin at its centre. A second plate similar to the first is mounted in the same manner, and both plates move across the lens in parallel planes. The second or auxiliary shutter is pushed in one direction by a rod having a knob projecting outside the camera, and brought back to its normal position by a coiled spring. On one part of this shutter is a cam, and on another part is a recess to engage a catch, which holds the shutter "open" until the first shutter releases this catch, when the auxiliary shutter is at once returned to its normal position, carrying with it the shutter proper.

The two shutters are both mounted on the same pin or axis, and are connected by a coiled spring, so that when the auxiliary shutter is moved, the shutter proper tries to follow, but is prevented by a catch until the slot in the auxiliary shutter is coincident with the lens aperture, whereupon the cam on this shutter releases the catch, and the shutter proper then travels across the lens aperture, and so gives the exposure, and afterwards releases the catch, which engages the auxiliary shutter, and the two shutters are drawn back by the coiled spring in such a manner that no light is admitted while so returning.

8,232. *May 13th*, 1891.—"Cameras." B. G. P. Möller, Kolding, Denmark.

The camera is provided with a chamber above, or at the side of same, and a magazine or storage space behind the camera proper and said chamber; also a slide plate provided with a shoulder and a retaining device, the arrangement being such that photographic plates are held by the slide plate in the chamber until required for use, and are, by inward movement of such slide-plate, introduced one at a time into the camera proper for exposure, after which the retaining device acts first to prevent a return movement of the exposed plate when the slide plate is drawn outward, and then presses the exposed plate into the magazine or storage space. The magazine is divided, by means of a removable device, such as a screw, into two spaces, one of which receives the plates which have been exposed, and the other receives the plates from the first space when the removable device is drawn back. The plates are stored in this space until it is required to develop them. By means of a sliding drawer which carries the objective lens, and a scale of distances used in conjunction therewith, objects which are very near, as well as those far distant, can be photographed with this camera.

10,798. *June 25th*, 1891.—"Shutters for Cameras." J. Kershaw, Spring Gardens, Buxton, Derby.

The shutter is a flexible blind. At one side of the shutter, and on one end of the liberating roller, is attached a pulley, to which is connected a cord, and at a pre-arranged part of said cord is placed a stop. To the side of the shutter is also connected a flat steel spring, which is caused to fit against the face of the pulley, with a space under the pulley, and between the spring and side of shutter, for a pneumatic bulb, which is actuated through a tube and similar bulb connected thereto, and held by the operator. A stud is placed on the face of the pulley to engage with a stud on the inside of the spring to prevent the blind re-winding. Guides are also attached to the shutter and inside of the spring through which to pass the cord attached to the pulley. This shutter can be used either as an instantaneous or time shutter.

London and Provincial Photographic Association.—November 12th, "Cau Halation be Avoided by Staining the Film in any way?" November 19th, lantern night.

"Goodness, John, how queer baby looks! I believe he is going to have a fit." "By George! I believe you are right. Where's my camera?"

Bleaching of Wax.—When beeswax is exposed in thin layers to the air and to direct sunlight, it is quickly rendered colourless; but in the dark, in presence of a free supply of air, oxygen, or ozone, no decolourisation whatever is effected, even after a long time. In presence of sunlight, oxygen, and especially ozone, destroys the colour very rapidly, but the presence of oxygen is not absolutely necessary. When the wax is exposed to sunlight *in vacuo*, or in an atmosphere of carbonic anhydride, it is bleached, but much more slowly than in the presence of air. The composition of the unbleached wax differs considerably from that of wax which has been bleached by exposure to air and sunlight. The latter contains a slightly larger percentage of free acids, but a large proportion of the unsaturated acids of the oleic series and of the unsaturated hydrocarbons in the crude wax have disappeared. This fact shows that in the bleaching process not only does the colouring matter suffer total combustion, but the unsaturated acids and the unsaturated hydrocarbons are converted into saturated compounds by the fixation of oxygen. This is also the case with other fatty substances, such as suet, and the reason why the addition of one to five per cent. of suet to beeswax causes decolourisation to proceed more quickly is because the suet, in its oxidation or combustion, aids the destruction of the colouring matters. The addition of a small quantity of other oxidisable substances, such as essence of terebenthene, also hastens the action, so that it would seem that the destruction of the colouring matter is due to the formation of ozone by the oxidation of the added substance.—A. and P. Buisine.

Messrs. Adams and Co. have lately introduced a very handy and useful dish with a loose cover, enabling the operator to shield his plate from any access of light during development. This will be especially valuable in isochromatic work.

# Correspondence.

## PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Sir,—The following are the arrangements for the lantern displays at the Exhibition on the dates named:—Saturday, November 7th, competition slides; Monday, November 9th, competition slides; Wednesday, November 11th, lantern slides by Mr. J. A. Sinclair, illustrative of "A Scamper through Normandy"; Thursday, November 12th, last night of the Exhibition—slides sent by Tasmanian and Indian contributors, and the prize competition slides.

Kindly announce that the next ordinary meeting of the Society will take place on Tuesday next, November 10th, at eight p.m., at the *Gallery*, 5a, *Pall Mall East*, instead of at the Society's rooms, as has already been announced. Mr. Leon Warnerke will read a paper, illustrated by lantern slides, on "Photographic Technical Instruction upon the Continent." The medals will be presented to the prize winners.

H. A. Lawrance, *Assist. Sec.*

50, *Great Russell Street, Bloomsbury, W.C., November 2nd.*

## "IN THE LAW COURTS."

Sir,—Referring to an article in your issue of October 30th entitled "In the Law Courts," it is not correct that I enclosed a photograph of my picture, "On the Threshold," or "The Bride," in a letter to the *Queen* art critic, suggesting it should be published in that paper.

What did happen was as follows. In the spring of 1890 I received a letter from the *Queen* art critic, asking me for the titles and descriptions of the pictures in my studio, as I understood, for an article on the pictures of the year by lady artists. I replied by sending him a number of photographs of my various pictures, including the one alluded to, asking him to describe them from the photographs, I being very busy, and not having time to do so. Shortly after, I heard from him that he particularly admired the "Bride" picture, and that the *Queen* would like to give it a prominent place in that paper. To this I replied as follows: "The original picture is all but sold to *Myra's Journal*. I only sell the colour copyright, and *after* it is produced in colours I have the right to dispose of the subject in any shape or form in monochrome." This was alluded to by Lords Justices Lindley, Lopes, and Fry as "the commencement and opening of negotiations, not a definite license, still less a concluded agreement," and, in addition, they also called attention to the fact that I distinctly stated that I had *no power* to dispose of the monochrome till *after* the coloured plate had come out. Hearing nothing further, I, of course, concluded the matter dropped, and a little later, being asked by Messrs. Keep and Co. to let them have the monochrome in addition to the colour copyright, I agreed to do so.

I must ask you to publish this letter correcting the misstatement alluded to, which has been the cause of much annoyance to me. M. H. Earnshaw.

65, *Harley Street, W., Nov. 2nd.*

# Proceedings of Societies.

## London and Provincial Photographic Association.

At the meeting held on Thursday, the 29th ult., the chair was occupied by Mr. J. S. Teape. It was announced that on the 19th inst. the results of the lantern slide competition would be shown.

Mr. T. E. Freshwater showed a new form of lantern condenser, and an arrangement for regulating position and distance of burner, of which he gave the following description:—The form of condenser fitted in the present instance is the one designed by Mr. J. Traill Taylor, which consists of two lenses five inches in diameter, and a smaller collecting lens. The principle upon which this condenser is constructed is, that the first lens takes up an angle of 95 degrees of light from the radiant, which is parallelised by the second lens. The third lens cones down this parallel beam so as to fill the focussing lens, and is made removable, so that similar leuses of different foci may be substituted to suit various objectives of long or short focus. In optical or magic lanterns where large condensers are used to cone the light down through the picture on to the focussing lens, it is obvious that it is advisable to place the picture at such a distance from the condenser that the whole of the cone of light passes through it, that the utmost illumination may be obtained on the screeu. This object is frequently attained by moviug the slide forward till it reaches the desired position ; but this uecessarily pnts it out of its right position as regards the front lens, so that it has to be re-focussed, besides which the amount of variation shown on the screen by re-focussing, &c., prevents the operator from ascertaining the effect the movement of the picture has on the illumination. This was partly remedied afterwards by moving the focussing lens *with* the picture ; bnt this, besides altering the size of the picture ou the screen, could only be fitted to the best forms of lanterns at the expense of rigidity, which, though of less importance in a cheap, simple lantern, is fatal in the case of lanterns with heavy lenses of twelve and fourteen inch focus, the fronts of which should be rigidly attached to the coudeusers, that the axis of the lenses may be kept optically true. To obviate these difficulties, the condenser (preferably a triple combination, five inches iu diameter) is fixed in a solid brass mount fixed to a brass base in grooves on the tray upon which the lime-jet fits. This brass base travels by donble racks-and-pinions, or screws on a stout metal bed-plate, to which the front plate of the lantern carrying the picture and focussing lenses is also permanently attached. By this means we can, after focussing the picture on the screen, move both condenser aud jet together away from the slide without affecting the picture on the screen in any way except by increase or decrease of illumination, and so can adjust the relative positions of the cone and the picture without difficulty. Should slides of various shapes and sizes require to be exhibited in succession, the condenser and jet may, if desired, be racked backwards or forwards to suit any one of them without altering any of the other adjustments, and without moving or affecting the picture on the screeu in any way, except by increasing its brilliancy. The lantern front, being fixed to the bed-plate, is perfectly rigid, and if it requires tilting up or down to make the disc coiucide with other discs on the screeu, this may be done in the usual way, without in any way affecting the optic axis, as the jet, condenser, slide, and front lens all move together. The tray carryiug the jet is preferably fitted with rack motions, aud to slide it into grooves on the travelling base of the lantern, so that, though it can be moved, together with the coudenser, by means of the rack already described, it can also be moved independently to and from the condenser, and above and below, and to right and left of the optic axis, so that it may be readily centred.

Mr. F. A. Bridge enquired whether the triple form of condenser really gave more light than the double form.

Mr. Freshwater said that it did, the angle of light taken up by the back lens being 95 degrees.

Mr. A. Cowan asked whether Mr. J. H. Dallmeyer did not construct a triple condenser many years ago.

Mr. Freshwater said that that was so. The triple form was not new, and they did not claim anything in the condenser.

Mr. A. L. Henderson showed two transparencies printed by contact from one negative, the one priuted on au ordinary plate, and the other on a special slow plate for transparency work. No amount of dodging, he said, would enable the worker to get as good a result with the rapid as with the slow plate. Contact printing, too, he considered necessarily better than by the camera, as, in the latter case, there was some diffusiou of the light passing through the negative. At the same time, he showed a transparency made on wet collodion from a negative which was so much under-exposed, and so thin in the details of the shadows, that it was remarkable that so much could be got out in the way of making a positive. With collodion, he said that a phantom image could be built up, but not with gelatine.

The Chairman said that wheu making a transparency from a thin, weak negative, he had given one-fourth the exposure that a normal uegative would require, and had developed with hydroquinone and caustic alkali, but used two parts of the hydroquinone solution to one part of the soda solution, instead of the equal proportions used for ordinary work. For a very intense negative, on the other hand, he had used two parts of the alkali to one of the hydroquinone solution, and added two grains of bromide of potassium to each ounce of the developer. The chairman also showed some further experiments with the reversal of the image ; but he had failed in obtaining the negative image again by the most prolonged exposure, up to 512 times that which had sufficed to produce the first reversal.

A question from the box was read : "In dealing with the focus question at the Polytechnic Institute last week, Mr. Debenham showed diagrams illustrating the formation of an image by a pinhole and by a lens. Is there any difference other than that of intensity iu the two cases ?"

Mr. Debenham said that, with a pinhole, defiuitiou is equal for any distance. With a lens, definition is more perfect at the focus, but falls off at other places.

Mr. Weir Brown said that Mr. Chapman Jones had recently given a process for reducing intensity by converting the image into bromide of silver, and then redeveloping to such inteusity only as desired, and stopping short when the intensity was reached. He (Mr. Weir Brown) thought that by that method the gradation in the lights would be lost; as by stopping the developmeut when only a certain depth of deposit had been reached, the high-lights would not have all their original depth, whilst the half-tones would be developed to the full.

Mr. Debenham said that that would depend very much upon the manner of developing. With a strong developer acting rapidly, the surface might be developed fully before the lower stratum was reached, but with a weak developer permeating the whole film, development of all parts would go on together, and so variations of manipulation might enable the operator to obtaiu varyiug results as desired.

### Richmond Camera Club.

On the 30th October the subject for discussion was "Flash-Light Photography." Mr. Cembrano presided.

Mr. J. G. Hudson, inventor of the "Kolm" time exposure magnesium lamp, explained the apparatus, by which a sustained light is produced by means of magnesium powder, the power of light being under the control of the operator. (By aid of this lamp, the President took two photographs of the members present, and was then photographed himself, the exposures varying from five to fifteeu seconds.) Mr. Hudson also exhibited a repeating flash-lamp of his own design, and several other makes were shown by members present.

### Bath Photographic Society.

The first ordinary meeting of the winter session was held at the Royal Literary and Scieutific Institutiou on Thursday evening, the 29th ult. Mr. G. F. Powell presided. Gifts to the Society were announced of books, and of a large direct photograph of the members of the Photographic Convention (Bath meeting), suitably framed, and presented by the Hon. Sec., Mr. Middleton Ashman.

Mr. Philip Braham, F.C.S., delivered a lecture on "Light Phosphoresceuce, Fluorescence, Diffraction, Interference." The lecturer said it was his purpose to analyse, to a certain extent, what light really was. He spoke of the theories advanced by scientists, dealing first with that known as molecular, and then with the vibratory hypothesises. Phosphorescence, he said, was a property fouud in some bodies which enabled them to be rendered sensitive when acted upon by a strong light, and retain the imparted luminosity for a considerable time, but slowly remitting it in the dark. Fluorescence, on the contrary, was not so excited, and its peculiar properties were only manifest in the presence of light, as illustrated in uranium glass and certain liquids. The brilliant light from burning magnesium was made to impinge upon evolutions of this character with satisfaetory results. Diffraction was next shown, illustrated by interposing a slit in the path of the beam from a limelight apparatus.

The well-known dark bands thus produced were then photographed by a member, Mr. H. G. P. Wells, and exhibited to the audience. Interference was also shown, the bands of colour so produced being well discerned on the screen.

### Putney Photographic Society.

*October* 31*st*.—Rev. L. Macdona in the chair.

Mr. S. H. Fry, of the Fry Manufacturing Co., gave a demonstration on bromide enlarging on their new "Naturalistic" paper. Mr. Fry first showed members the method of judging the correct exposure, giving 4, 8, 12, and 16 seconds. He then proceeded to enlarge a quarter-plate negative of a yacht on the Thames to 12 by 10 inches, using hydroquinone as developer, and fixed in an acid bath composed of—

| | |
|---|---|
| Hypo ... ... ... ... ... | 4 ounces |
| Bisulphite soda ... ... ... ... | 1 ounce |
| Water ... ... ... ... ... | 16 ounces |

He showed the members that they could obtain with hydroquinone results quite equal to those by ferrous oxalate, with less uncertainty and greater simplicity, as, by the use of the acid fixer, the operations could be reduced to two. He succeeded in producing two very beautiful enlargements, one of which he presented to the chairman. Not the least interesting part of the demonstration was his method of printing-in clouds by covering the foregrouud (after development and while still wet), and then printing-in the clouds from another negative. Mr. Fry showed how simple it was to bring out flagging detail by breathing upon the print, and by local application of developer on a pad of absorbent cotton-wool.

Messrs. J. B. Ball, S. Buckland, and A. E. Smith were elected members, making nine new elections during the month.

### Enfield Camera Club.

At the meeting held on the 28th ult., Mr. W. H. Trewartha James read a paper entitled "Notes on Hand-Cameras." The paper dealt first with those parts common to all hand-cameras, and expressed the opinion that the reflecting mirror type would ultimately hold the field for the highest class and greatest range of work. Bag changers properly made were certainly the most compact and convenient form, but if size and portability were unimportant, then properly made magazine cameras, and after them dark slides, held the field. Most of the automatic changers required rather delicate mechanism, aud in the well types the jarring of the plates seemed a great defect, though otherwise many of the movements were reliable aud very ingenious. In summing up, the use of the tripod was strongly insisted on, as even with the fastest lenses aud dry plates, and the best control over shutter speeds, it was only under favourable conditions of light and subject that properly exposed plates could be relied on. There was no doubt that hand-camera work (not mere snap-shot practice) would, as its conditions became better appreciated, grow into increasing popularity and value.

A fine show included many of the best types of instruments in the market, in addition to several very clever home-made and home-designed cameras by members present.

### Oldham Photographic Society.

The annual meeting was held on October 29th, the president, Mr. T. Heywood, presiding.

The Secretary read the report for the past year, and the Treasurer's statement of accounts; after which the election of officers took place, as follows:—*President*—Mr. Wallace Thompson; *Vice-President*—Mr. J. Chadwick; *Treasurer*—Mr. W. Schofield; *Librarian*—Mr. L. Tetlow; *Committee*—Messrs. J. H. Ashton, J. Brooks, J. S. Drousfield, J. Creaves, junr., T. Heywood, W. Jackson; *Honorary Secretary*—Mr. T. Widdop, 16, Burnaby Street, Oldham; *Assistant Secretary*—Mr. W. A. Nash.

During the election, Mr. J. Mellalieu, of Middleton, exhibited a novel developing arrangement, consisting of three bottles with pipettes for dropping, which he intends shortly putting upon the market.

## Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**All Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

C. (Nelson).—*Aristotype Prints.* The fact of the spots appearing on both samples of gelatino-chloride paper would seem to indicate some adventitious fault in your own working. They look like splashes of hypo, but, as you say the spots became visible in the last washing of No. 1 print, this could hardly have been the cause; nor are they blackened by touching with nitrate of silver solution, so there is no hypo there now. They are not due to metallic contaminations in the paper, or each spot should have a dark nucleus, which is not the case. We have known silver prints to become spotted and stained by long contact with zinc washing troughs, bronze powder, or even with dry particles of pyrogallic acid, and other chemicals. The evidence in this case does not enable us to unravel the mystery, but we will write to you in the event of our finding out anything more definite with regard to these prints.

S. B. (Notts).—*Cleaning off Old Negatives.* Immersion in hot water and soda usually loosens the film, so as to permit of your cleaning the glasses with very little rubbing. If they are collodion negatives, wood naphtha cleans off at once both film and varnish. Finish off with a good rub with whiting and water.

W P.—*Gum Tragacanth.*—You will not succeed in getting this to dissolve in water like gum-arabic, and we do not anticipate that you will be able to use it as a substitute for mounting. Try glue soddened in cold water, lifted out and mixed with warm dextrine, say equal parts by weight.

T. H.—*Sandringham Photographs.* Two years ago Mr. H. Bedford Lemere, of 147, Strand, showed some views of Sandringham in the Pall Mall Exhibition, and we have no doubt that others can be obtained of Messrs Spooner and Co.

L. M. (Ryde).—*Moisture in Paper.* The amount varies according to temperature, and the state of dryness of the surrounding atmosphere. Dr. Russell and Captain Abney found that the sample of Whatman's drawing paper used in their experiments on the actiou of light on water-colours, absorbed from 12 to 12½ per cent. of moisture. Some time ago we found that the thick white post cards, which are made of very inferior paper stuff, absorbed as much as 15 per cent.

E. D.—*The Earthquake in Japan.* We join with you in sincerely hoping that Professor W. K. Burton is not amongst the injured, and that he may shortly be in a position to give evidence with respect to the painful and calamitous events happening in the laud of his adoption.

B. E.N.—*Aluminium Leaf.* Since replying to your enquiry last week, we have been informed that the Aluminium Company, of Oldbury, Birmingham, supply this article in a form suitable for burning in oxygen. It is now being used as a cheap substitute for silver leaf, for a variety of ornamental purposes, not being liable to tarnish.

Subscriber.—*Lantern Soirée.* Just a note to remind you and other London friends that the Pall Mall Exhibition will be opened to-night for the benefit of the Photographers' Benevolent Association.

Received.—From Mr. T. Cranfield, of Grafton Street, Dublin, a 16 by 12 photo. of group of chemists assembled at Trinity College, ou the occasion of the meeting of the Society of Chemical Industry in July last; from Professor Meldola, a copy of "Cantor Lectures ou Photographic Chemistry," delivered at the Society of Arts.


## Subscriptions to the Photographic News.

Including Postage to any part of the United Kingdom:—
Yearly...10s. 10d. | Half-Yearly...5s. 5d. | Quarterly... 2s. 9d.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1732.—*November* 13, 1891.



CONTENTS.



## LANTERN SLIDES BY REDUCTION.

The most popular method of producing lantern slides is by contact of lantern plate with negative, and the majority of plate manufacturers seem to take it for granted that most of their customers will adopt this plan. It certainly has the merit of extreme simplicity, and, provided that the negative from which the slide is taken embraces in a space of about three inches the whole of the composition which it is desired to include in the lantern picture, no fault can be found with the system. Some workers take their negatives for the express purpose of producing from them lantern pictures, and they are careful to have a space of the standard size pencilled on the ground-glass screen of the camera. Others are content to obtain by contact a lantern picture from such part of a quarter-plate negative as will give the best result. The fact that the great majority of commercial slides are made square, or round, so as to fill up the whole of a sheet—also, by general agreement, square in shape—has caused the large army of amateur lantern slide producers to follow suit, and an oblong picture was, until lately, quite the exception. The introduction of cameras for reducing larger negatives to lantern size has resulted in a change for the better, for there is little doubt that an oblong picture is far more satisfying to the eye than one which is either round or square. Our picture galleries give evidence that artists generally prefer the oblong shape, and lantern slide makers would do well to follow so good a lead.

Unfortunately, one of the most desirable processes by which slides can be produced cannot be employed except for contact pictures. We allude to the old albumen process, which deservedly holds front rank for such work. Those who have succeeded in producing lantern slides of that kind will think twice before they change their method, for the pictures given are beautifully transparent, and the film is almost as hard as the glass upon which it rests. A properly executed albumen picture on glass is, indeed, as permanent a thing as photography is capable of producing. The collodio-bromide process, although slow, yields excellent results by reduction in the camera, without the chance of abrading the tender film which printing by contact is apt to bring about. As our readers know, the majority of commercial slides are due to the wet collodion process, and these are mostly reduced from larger negatives. Amateurs, on the other hand, mostly favour gelatine slides, and excellent results are obtained by the various makes now in the market; but, as already intimated, most of them are used in contact with the negative to be copied.

We have for some time, in our own practice, adopted a method of producing slides by reduction which, while most certain in its results, leaves little to be desired in the way of convenience. The negatives employed are quarter-plate size, and they are reduced to 3 by 2⅝ ins., being finally framed with a mask slightly smaller. By dispensing with daylight, we at once eliminate one source of trouble, for daylight at this season of the year is far too variable a thing to depend upon. Even if we get a decently fine day, the actinic value of the light varies from hour to hour, almost from minute to minute. We employ a lime jet with a very small bore, so that the spot of light is not more than a quarter of an inch in diameter. This light is contained in a roughly-made lantern furnished with a six-inch (diameter) condenser. In front of this condenser, and close against it, stands a frame to hold the quarter-plate negative, which is buttoned into its place in a moment. On the same base-board is an ordinary camera fitted with a 6-inch rectilinear lens pointing towards the negative, and this camera holds a carrier of lantern plate size. After the first negative has been focussed, and it has been ascertained that every part of the apparatus is well centred, picture after picture can be produced with the utmost regularity and certainty, the only condition being that the duration of exposure is regulated according to the density of the particular negative in hand. The full aperture of the lens is employed, and the amount of light is such that a very brief exposure is necessary with a normal negative. With a bromide lantern plate (commercial) this averages about ten seconds. A chloride plate will require, with the same negative, about two minutes; but the latter is not suitable for this work unless the negative be very thin, when it will give a better result than a bromide plate.

From what has gone before, it will be evident that the common form of enlarging apparatus now sold can be adapted to this work of reduction. With the objective removed, and a camera pointing towards the condenser through the lens aperture, the worker will have at command all that he requires, care being taken that both camera and enlarging apparatus are firmly held between rails on one base-board. The use of the limelight is now so general that many workers have it ready to their hand, and they will find it of great value in this work of reduction; but, of course, other luminants may be employed. We have advocated its use in the work of reduction for the reason that, in our hands, it is very quick and certain in its results.

## AT MESSRS. VALENTINE AND SONS, DUNDEE.

Accident brought us the other day to the Royal borough of Dundee, the busy city on the Firth of Tay, which boasts the largest population of any place in Scotland next to Ediuboro' and Glasgow. While there, we took the opportunity of calling upon Messrs. Valentine and Sous, and were courteously shown over the whole of the extensive works, the largest establishment of the kind in the world, Mr. Valeutine told us. The factory, of which there is a branch elsewhere, is situated in the higher part of the town on the Perth road, and from its windows we can see the Firth, which here is a mile and a half broad, spanned by the bridge which has been built on the site of that which, oue Sunday night twelve years ago, crashed down with a train-load of passengers into the dark river. Messrs. Valentine's factory found its nucleus in an old-established portrait gallery which is still in full swing; so that it presents at first sight all the moderu refinements of a first-class gallery. It is not until we get behind the scenes—so to speak—up and down staircases, and in aud out of buildings at the back, that we realise that the main business is comprised in the production of those views of places of public resort which are seen in every stationer's shop in the kingdom, and which are purchased in such large numbers by tourists and globe trotters. In making these views, several out-door artists are constantly engaged all through the season, while a small army are at work here at head-quarters in developing, printing, and finishing the pictures for the market.

In the developing room we find every possible convenience, and note that the operators are by no means stiuted for light. Of course the light is of the non-actinic variety, but still there is plenty of it, so that the dark room assistants have not to work—as, unfortunately, so many do—in semi-obscurity. The printing is done mostly by girls, and the frames stand on sloping supports, which, being on wheels, can be run under a glass roof should rain come on. These girls are constantly going from one printing frame to another, and as soon as a print is completed, it is handed into an adjacent room, where the picture is quickly removed and the frame recharged. The albumenised paper is sensitised on the premises, no preservative being necessary, for the material is used up too quickly to need it. Pictures in carbon are also produced here by the thousand; these are mostly on opal. Other pictures are mounted behiud bevelled glass with ornamental borders, and we learn that this description of goods has a very large sale.

We were much struck with the excellent washing arrangements for silver prints adopted at these works. There are a number of rectangular cisterns about two feet in depth which are constantly fed with water, and emptied automatically by syphon attachmeut. Inside each cistern fit a number of wooden frames, stretched over the bottom of which is a network of gutta-percha strings. In the tray so formed the unwashed prints are placed, and wheu one is full it is placed in the empty cistern, and another one put above it. These trays of prints are thus disposed of until the cistern is full. When the water is turned on, it will readily be seen that under this system each print is actually floatiug, and at the same time is separated from its fellows above and below. We cannot possibly imagine a more perfect method by which the salts cau be washed out of the paper.

Where it is necessary to print in a sky to a view from a separate negative, great care is taken that a suitable cloud uegative is wedded with the particular landscape in hand. This matter is decided once and for all by the foreman in charge, and the landscape negative has attached to it its own number and the number of the sky negative with which it is to be associated. This busiuess of printing-in the skies is the care of a separate department. In another room of this busy factory we notice several cameras pointed skywards, for making lautern slides by reduction from larger negatives. The cameras are focussed ouce for all, so that the operators merely have to place negative after negative in position, and to expose them for a certain time. We need hardly say that the wet process is employed for this work.

Associated with the washing arrangements already detailed is a most complete system for saving the residues, and that this system is efficient may be judged from the circumstance that considerably more than £1,000 per annum is netted from this source alone. A consideration of this fact will also help us to gauge the extensive nature of Messrs. Valentine's operations. Mr. Valentine was kind enough himself to show us over his premises, and was evidently proud of them. We left him with the impression that he certainly had every reason to be so.

Photographic Club.—Wednesday, Nov. 18th, annual dinner; Nov. 25th, monthly lantern meeting.

The Lantern Society.—The next meeting (lantern evening for members and friends) will be held on November 23rd.

North London Photographic Society.—As it is hoped that the subject, "Bromide Printing," will be opened on November 17th by Mr. F. A. Bridge, a large attendance is expected in Wellington Hall, Islington, which has now been secured for the Society's meetings. Visitors are invited.

North Middlesex Photographic Society. — The annual exhibition of photographs will be held at Jubilee House, Hornsey Road, on Monday, December 14th. All exhibits must be delivered at Jubilee House, not later than 9 p.m., on Friday, December 4th. In order to facilitate the cataloguing of the pictures, each picture should have attached to it a label, upon which should be written the exhibitor's name, title of picture, and process. The labels will be supplied, upon application, by the hon. sec., Mr. J. M'Intosh, Jubilee House, Hornsey Road, from whom all information respecting the exhibition may be obtained.

## PHOTOGRAPHIC MISCELLANEA.

BY H. C. STANDAGE.

To prepare an *Alcoholic Solution of Gelatine*, soak gelatine in water until it swells up, then melt it, and finally add four to five times its quantity of absolute (*i.e.*, 95 per cent.) alcohol. The solution remains entirely clear, runs off like collodion, and dries far quicker than gelatine emulsion with 5 per cent. of alcohol, and it can be compounded with ammonia to basic reactions without injuring its firmness. According to one authority, a mixture of 1 part of dilute nitro-muriatic acid and 48 parts of rectified spirit of wine dissolves almost any quantity of heated gelatine. Poured over plates, the solution dries twice as quickly as plates treated with collodion. Ether and chloroform compounded with the above acid mixture also dissolves gelatine.

*An Alkaline Gelatine Developer* is made by dissolving $1\frac{1}{8}$ ounce of Nelson's amber gelatine in $2\frac{1}{4}$ fluid ounces of water over a water-bath; then add 1 fluid ounce of saturated solution of caustic soda, and boil until the solution is thinly fluid. Take 1 part of this solution to 8 parts of solution of pyrogallic acid in the proportion of 1 to 250. No bromide of potassium is required. Expose for a very short time, as over-exposure cannot be remedied.

*An Emulsion of Chloride of Silver and Gelatine* can be made thus: taking 1,000 parts of water, dissolve each of the following chemicals separately in a part thereof:—

| | |
|---|---|
| Gelatine ... ... ... ... ... | 50 parts |
| Nitrate of silver ... ... ... ... | 15 ,, |
| Chloride of gold ... ... ... ... | 5 ,, |
| Citric acid ... ... ... ... | 5 to 10 ,, |

When the several solutions are complete, add to the gelatine first the nitrate of silver, then the chloride of gold, and finally the citric acid. It is immaterial whether the emulsion reddens or not. It is now ready for use without washing. Coat glass plates with the emulsion, and print quite dark in the photo printing frame. The shades bronze quickly, and the intensity with a stable emulsion is good. In case the tones are a dirty yellow instead of black, the quantity of citric acid must be increased, which will always rectify this evil. The diapositives thus produced must be still further toned, which is best done in a bath of cyanide of gold. It is fixed with weak hyposulphite, then washed, tanned with alum, and finally washed again.

*To Prepare Claudet's Instantaneous Positive Paper.*—Float the paper on a solution of—

| | |
|---|---|
| Distilled water ... ... ... ... | 500 parts |
| Corrosive sublimate ... ... ... | 20 ,, |

Then dry it, and wash with a solution of—

| | |
|---|---|
| Nitrate of silver ... ... ... ... | 5 parts |
| Distilled water ... ... ... ... | 60 ,, |

The negative is exposed to the light over this prepared paper for from twelve seconds to one minute. The picture is developed by immersion in a bath of—

| | |
|---|---|
| Sulphate of iron ... ... ... ... | 1 part |
| Radicle vinegar ... ... ... ... | $1\frac{1}{2}$ ,, |
| Distilled water ... ... ... ... | 30 parts |

The positive picture is then washed, and fixed with sodium hyposulphite.

To make *Clear Caoutchouc Solutions*, tie 30 parts of caoutchouc, cut up in small pieces, in a small linen bag, fasten this to the cork of a bottle containing 1,000 parts of benzene.

*Damson's Tannin Plates.*—1. Recipe for the collodion cotton: Sulphuric acid of 1·840 specific gravity, 1,000 parts; nitric acid of 1·450 specific gravity, 360 parts; water, 240 parts; and cotton, 50 parts. 2. *Collodion*: Collodion cotton, $\frac{1}{3}$ part; ether of 0·725 specific gravity, 15 parts; alcohol of 0·810 specific gravity, 15 parts; sodium iodide, $\frac{1}{10}$ part; sodium bromide, $\frac{1}{12}$ part. 3. *Solution of Tannin*: 1 part of tannin dissolved in 30 parts of distilled water.

*Motta's Developer for Gelatine Plates.*—

| | |
|---|---|
| Saturated solution of potassium ferricyanide | 120 parts |
| Water ... ... ... ... ... | 120 ,, |
| Pyrogallic acid ... ... ... ... | 1 part |

Before using the developer, a few drops of ammonia are added to every 15 parts of it; the plate is then washed and dipped into the mixture.

*Davanne's Intensifier.*—In case a plate has been spoiled, it is, after exposure, only partly developed, and fixed with solution of cyanide of potassium; the plate, after having been freed from the last trace of the fixing salt by washing, is treated twice or several times with a solution of 2 grains of pyrogallic acid, 1 grain of citric acid, and 10 drops of radicle vinegar in 1 fluid ounce of distilled water, to which a few drops of a solution of silver of fifteen per cent. have been added. It is next treated with the following fluids:—

| | |
|---|---|
| 1.—Iodine ... ... ... ... ... | $5\frac{1}{2}$ grains |
| Iodide of potassium ... ... ... | 10 ,, |
| Distilled water ... ... ... ... | 1 fluid oz. |
| 2.—Sulphate of potassium ... ... ... | 1 drachm |
| Distilled water ... ... ... ... | 6 fluid ozs. |

Solution No. 1 is poured over the plate either in daylight or in the dark room, and allowed to remain upon it until the precipitate is perfectly yellow; it is then rinsed off with water, and solution No. 2 poured upon it, and this allowed to remain until the yellow colour is changed into a deep brown.

A developing solution of oxalate of iron, given by Vogel, is the following:—

| | |
|---|---|
| A.—Neutral oxalate of potassium ... ... | 9 ounces |
| Water ... ... ... ... ... | 1 quart |
| B.—Sulphate of iron ... ... ... ... | $3\frac{1}{3}$ ounces |
| Water ... ... ... ... ... | $10\frac{1}{2}$ fld. ozs. |
| Sulphuric acid ... ... ... | 2 to 3 drops |

A supply of both solutions should be kept on hand. For use, mix 3 volumes of A with 1 of B. Should the plates appear clouded, add to 4 fluid ounces of the mixed solution several drops of a solution of bromide of potassium containing 3 parts of bromide to 58 of water.

*A Good Toning Bath* is made of—

| | |
|---|---|
| Chloride of gold ... ... ... ... | 1 grain |
| Sodium acetate ... ... ... ... | 32 grains |
| Sodium carbonate ... ... ... | $4\frac{1}{2}$ ,, |
| Water ... ... ... ... ... | $8\frac{3}{4}$ fld. ozs. |

The following solution should be kept on hand:—

| | |
|---|---|
| Chloride of gold ... ... ... ... | 15 grains |
| Sodium acetate ... ... ... ... | 1 ounce |
| Water ... ... ... ... ... | $12\frac{3}{4}$ fld. ozs. |

Some of this being added from time to time to the toning bath as it becomes weaker by use. The copies, after toning, are several times washed with water containing some common salt, and finished in the following bath:—

| | |
|---|---|
| Water ... ... ... ... ... | $3\frac{1}{2}$ fld. ozs. |
| Sodium hyposulphite ... ... ... | $8\frac{3}{4}$ ounces |

The fixing bath is previously neutralised with sodium carbonate or ammonia.

*A Good Intensifying Bath for Gelatine Negatives* is made by mixing the following solution :—

| | | |
|---|---|---|
| A.—Corrosive sublimate | ... | 4 parts |
| Water | ... | 200 ,, |
| B.—Iodide of potassium | ... | 6 parts |
| Water | ... | 66 ,, |
| C.—Sodic acetate | ... | 8 parts |
| Water | ... | 66 ,, |

This intensifying bath has the advantage over other solutions that it can be used immediately after fixing the plates, and it gives the requisite intensity, even to the thinnest negatives, in a few minutes.

The following glycerine pyrogallic developer for bromide of silver dry plates is one extensively used :—

| | | |
|---|---|---|
| A.—Pyrogallic acid | ... | 1 part |
| Glycerine | ... | 1 ,, |
| Alcohol | ... | 6 parts |
| B.—Bromide of potassium | ... | 1 part |
| Ammonia of 0·880 specific gravity | ... | 8 parts |
| Glycerine | ... | 8 ,, |
| Water | ... | 50 ,, |

Both concentrated solutions keep for a long time. For use in developing, pour 30 parts of water into a saucer, add 1 part of solution A, and a like quantity of solution B, and submerge the emulsion plate in it. With a correct exposure the image appears in a few seconds, and the development is finished in a minute. Should the picture, in consequence of over-exposure, appear too suddenly, the developer must immediately be poured off, water poured into the saucer and some of the solution A added, which, with the residue of the remaining ammonia, will sufficiently develop the plate.

The two following printing recipes are well worthy of trial :—1. Preliminary preparations: Flow thoroughly cleansed plates with the following mixture: Potash water glass 1 part, and Pilsen beer 11 parts. When all the plates have been flowed, heat them somewhat and let them stand till the next morning, when they are again heated, washed, and stood aside to dry. 2. Chrome gelatine layer: Wash 25 parts of gelatine in several waters, and let them swell up in the last water; then dissolve 75 parts of chrome alum in 200 parts of distilled water, add the soaked gelatine, and heat the whole to 120° F. When the gelatine is entirely dissolved, add 25 parts each of bichromate of potassium and bichromate of ammonium. The plate, before flowing, is somewhat heated.

The following improvements in emulsions are suggested by an expert. The improvements consist in a combination of emulsion of bromide of silver and gelatine emulsion with pyroxyline. Four different methods may be employed. (1) Prepare a gelatine emulsion with bromide of silver (or iodide or chloride of silver), dry, and dissolve the emulsion in three to ten times its quantity of formic or acetic acid. This acidulated emulsion is used either by itself, or compounded with pyroxyline. (2) Dissolve pyroxyline by itself in one of the above acids with an addition of alcohol, and mix the solution with equal parts by volume of the above acidulated emulsion. (3) Prepare an ordinary collodion emulsion, precipitate it with water, dry the precipitate, and dissolve it in one of the acids mentioned, and add gelatine either direct or in solution. (4) Dissolve gelatine and pyroxyline, and add finely powdered bromide of silver (iodide or chloride of silver), or produce them in the emulsion. These new emulsions can be used either dry or wet.

*Sensitive Collodion for Rapid Methods* is made thus :—

| | | |
|---|---|---|
| Cotton | ... | 10 parts |
| Alcohol | ... | 400 ,, |
| Silver | ... | 500 ,, |
| Solution of iodide of ammonium... | ... | 45 ,, |
| Solution of cadmic iodide... | ... | 40 ,, |
| Solution of cadmic ammonio-bromide | ... | 35 ,, |

The latter is prepared by dissolving 6 parts of cadmic bromide and 4 parts of ammonium bromide in 100 parts of alcohol. Sufficient tincture of iodine is added to the collodion to give it an orange-red colour, and it is then allowed to stand three or four days. The silver bath must be neutral, but the collodion acid red.

*A Sensitive Collodion Emulsion* is made by immersing the plates coated with collodion emulsion from one to two minutes in a solution of—

| | | |
|---|---|---|
| Gelatine | ... | 1 part |
| Water | ... | 100 parts |

and then dry them. The plates treated thus are very sensitive, and, if correctly exposed, give a vigorous negative.

The following recipes for the gelatine process will be found very useful.

1.—*Edwards's Gelatine Developer.*

| | | |
|---|---|---|
| A.—Pyrogallic acid | ... | 30 parts |
| Glycerine ... | ... | 30 ,, |
| Alcohol | ... | 180 ,, |
| B.—Potassium bromide | ... | 4 parts |
| Ammonia ... | ... | 30 ,, |
| Glycerine ... | ... | 30 ,, |
| Water | ... | 180 ,, |

Take 10 parts each of A and B to 300 parts of water.

2.—*Dr. Eder's Oxalate of Iron Developer.*—A, saturated solution of sulphate of iron; B, saturated solution of neutral oxalate of potash; C, bromide of potassium 1 part, and water 10 parts. Mix 100 parts of A with 400 parts of B, and add 15 to 30 drops of C. Should the picture not appear in the course of five to ten minutes, dip it into the following stronger bath :—Dissolve 60 parts of neutral oxalate of potassium in 100 parts of barley water, and stir in this 15 parts of sulphate of iron. This bath, when cold, will keep in full bottles tightly closed.

3.—*Nelson's Developer.*

| | | |
|---|---|---|
| A.—Water | ... | 360 parts |
| Sulphate of iron ... | ... | 120 ,, |
| Alum | ... | 15 ,, |
| Sugar | ... | 30 ,, |
| B.—Water | ... | 720 parts |
| Neutral oxalate of potassium | ... | 240 ,, |

Mix 1 part of A with 2 of B.

4.—*Bedford's Developer.*

| | | |
|---|---|---|
| A.—Pyrogallic acid | ... | 4 parts |
| Nitric acid... | ... | ½ part |
| Water | ... | 600 parts |
| B.—Ammonia ... | ... | 8 parts |
| Bromide of ammonium or potassium | ... | 5 ,, |
| Water | ... | 600 ,, |

For a normal exposure, mix equal parts of A and B.

5.—*Abney's Intensifying Bath.*—Pour ¾ part of pyrogallic acid, 1 part of radicle vinegar, and 90 parts of water upon the plate, previously laid in alum for one hour, and add, after one minute, 1 part of solution of silver. Iron may be used in place of pyrogallic acid, viz. :—

| | | |
|---|---|---|
| Sulphate of iron | ... | 0·9 part |
| Citric acid ... | ... | 1·8 ,, |
| Water | ... | 90 parts |

## PHOTOGRAPHY ON THE PENNSYLVANIA RAILWAY.

We have already made reference to the great scheme now in progress for obtaining views on this wonderful highway. We now print some details of the enterprise, which we clip from an American paper.

Even in this advanced age, where the minimum responsibility resting on the shoulders of the art and picturesque-loving public amounts to simply pressing a "tiny button," and somebody else doing the rest, a description of the method by which the beautiful railroad views often seen are reproduced by the photographer may not, perhaps, be without some interest. The wonderful fad for photographing has certainly held a staple popularity with the fickle public, and steadily evoluted from a fashion, at one time only enjoyed by the privileged few who could afford the luxury, into a part of almost every boy, girl, and grown person's life and education.

It is, perhaps, only a question of a few years when photography will occupy in the curriculum of school education an important place with free-hand drawing and geography, for few courses are better drills and trainers for the eye and mind, at the same time creating interest. The howl and tirade against the snap-shot fiends, when they wandered about *incognito*, seeking what they might take, with that suspicious something under their coats, or the cautious handling of innocent-looking paper bundles, has about ceased, and they come forth openly now, sauntering along the principal promenades, shooting at random the unconcerned multitude. It is only another illustration of the old saying, "getting used to everything saves taxes and death," for certainly no people fall so quickly and harmoniously into the line of endurance when confronted by the inevitable as Americans.

It was during the centennial year that the first germs of the photographic fever took fast hold, and rose, stage by stage, until, in our day, as the enthusiastic physician might say, it has reached the full flush and progression of healthy disease. One particular series of pictures at the Centennial Exposition, to return to the theme of this article, was that exhibited by the Pennsylvania Railroad, and which conveyed and revealed to foreigners, much better than guide book or conversation possibly could, the territory of wealth and beauty, the iron bands of the main line and branches, extending in their ramifications, and intersecting from the Atlantic ocean to the far Mississippi, and from the great inland northern lakes to the crowning line of the Virginias.

They were the highest examples then known in railway photography, and often crowds were seen standing before the panoramic views in particular with open eye and mouth wonderment and speculation, advancing every possible solution as to the production of such a large negative, which, had they but known, meant three in one delicately fitted together. Just as marvellous and beautiful as those pictures appeared in that day, fifteen years ago, will a series now about finished, covering all the old and many new views, seem to those who will have an opportunity of viewing them in a few weeks at an exhibition in some place to be selected in the city, or at the World's Fair in 1893.

Photography has advanced with rapid strides, and with its progress, keeping an even pace by its side, is public appreciation and knowledge of its growth; so that nothing short of the result accomplished by a mammoth landscape camera, used in these last photographs, would have caused the public pulse to beat the least faster. It is perfectly safe to say that the amateur, and even the professional, will have much to learn from the results of this photographic expedition, fitted out some months ago by the Pennsylvania Railroad with as much care and almost the expense of an Arctic one, and which is still in the field of exploration, daily sending in remarkable illustrations of choice picture finds, and showing that which the regular traveller flying by on a fast express cannot see—some daring feats of engineering in bridge building, skilful cuts, road construction, and road-beds, with their even, solid stone ballast looking like a floor, while views of surpassing artistic beauty make the entranced looker-on want to capture the entire collection and create a private gallery of his own.

The Company fitted out a car for this photographic service, modelling and furnishing its interior from designs and suggestions of the practical operator whose life for five months of the year would be spent within, and from whose modern dark room some of the finest railroad views of the age would be developed within a few hours after capture.

To all appearance from the outside, car 1382, save an elevated platform on the top, and the name, "Photographic Car, Pennsylvania Railroad," is identical with the regulation coach. This elevation is half a foot high, and covers an area of some 6 feet square. It is especially constructed for supporting the instruments and cameras where a commanding view is desired at points where a foot or tripod-hold could not be found on the mountain's steep side. In length the car interior is 46 feet, in width 8 feet, and from floor to ceiling in height about 10 feet. It is fitted with steam-heating apparatus, which is not a bit amiss in the mountains, and air-brake appliances, with a precautionary measure taken, by having a hand-brake operated only from the interior of the car, whereby the deep-laid design of tramp and small boy is often thwarted, and a possible wreck prevented, when the car stands alone on a heavy grade.

The forward part of the car for some 20 feet is furnished and decorated with the exclusive end in view of promoting the comfortable living of the operator and his assistant, furnished as it is with comfortable parlour-car chairs and a commodious desk, well lighted. The walls are adorned with road schedules and maps, framed photographs and rare prints, ranging from the many views along the line of the railroad, to points in South America and Europe, and a rare series taken during the Transit of Venus Government Expedition of the Swatara in 1874 and 1875, for which Mr. William H. Rau was also the official photographer. Two modern folding plush sofa berths extend their tempting softness to the men after a hard day's mental and physical work, and add a decidedly finished appearance when made up into sofa seats during the day. In case of necessity, should a stop be compelled over night at a way station, a supply of cots can be brought into requisition for use of conductor, engineer, and crew, but this is not likely to happen any more than a call for the use of the cooking stove and utensils, for the car is a "personally conducted" one, and, running on the schedule of a special train, manages to stop over-night where the hotels have a table record.

The dark room is in the centre of the car, running for a distance of 12 feet in length and 5 feet in width, equipped with ruby and orange windows, negative racks, and all developing facilities, together with a tank holding a 300-gallon water supply. The system of perfect ventilation without allowing light to penetrate the dark walls and ceiling of this jet black apartment is accomplished by a 4-inch opening where the side wall meets the floor, and built out from this is a false side running to the roof and angled to an opening in the car, thus allowing a free passage of air, but not a ray of light. In this room may be seen the most complete batteries of lenses in active use in this country, starting with the tiny kodak, and advancing along the set to the orthochromatic, rendering colour values, and the case holding a valuable interchanging lens making nine different sizes or combinations of the one view.

All these are eclipsed, however, by the immense panoramic landscape camera, which takes a picture on the one negative 4 feet long and 1½ feet wide, which embraces an angle of 165°, and obviates the distortion and uncertainty so often encountered in the case of photographs taken by the sectional method. It is claimed to be the only camera of its kind in the world, designed somewhat on the same model as the one at the Paris Exposition, but taking a much larger and more accurate picture, and in many ways far in advance of this French camera, which was the wonderment and admiration of the representative world assembled at the Exposition. Far back in 1855 a man named Holterman, at Sydney, New South Wales, erected, at enormous expense, a camera, known as the great revolving lens, which is recorded as taking but one negative on a glass plate 3 feet by 4 feet, and then, with this world record of one picture, it was never used again. Probably, had the flexible plate been known and in use at that time, Holterman's results may have been household words to-day; but, mainly due to their non-existence and the cumbersome weight and immovability of the camera proper, it met with the fate of a rich mine with the ore in view, but machine facilities not invented for working it.

Every precaution is taken for the careful transport of the very valuable plates, and the rear portion of the car is devoted to the trunks built and padded for carrying the immense store of 300 18 by 22 and 30 panoramas.

## CO-OPERATIVE EXCURSIONS TO THE CHICAGO EXHIBITION.

Those of our readers who are longing to carry their cameras farther afield than the confines of their own country, may be interested in knowing that the committee of the Polytechnic Institution, Regent Street, London, are adding, to their already unique series of Continental tours, trips to the Chicago Exhibition in 1893, specially intended for those whose means will not permit them to visit the New World under ordinary circumstances. The authorities have already entered into a contract with the Inman Steamship Company, by which means those who participate in these excursions will travel by the fastest vessels afloat; parties will leave Liverpool weekly during the months of June, July, and early part of August, by the magnificent steamers, *City of Paris*, *City of New York*, *City of Chicago*, *City of Berlin*, and, travelling by these fast vessels, the whole tour will be able to be accomplished within one month. The proposed arrangements are, that two days shall be spent in New York; a visit to Philadelphia and Washington will also be made, proceeding from thence to Chicago, where each party will be allocated for six or seven days; the return journey will be continued through Buffalo to Niagara, visiting the world-famous falls, the journey back to New York being taken down the Hudson river, the views along which comprise some of the grandest scenery imaginable. The committee hope that the whole round excursion, including accommodation for the period, will not exceed twenty-five guineas, which is only slightly above the fare for the ocean journey alone during the season by the above steamers. Arrangements have been made thus early to enable those who desire to take part to put by so much per week towards the required amount; also to enable many who have, as a rule, but a fortnight's holiday, to forego their holiday next year, and get a special holiday of one month in 1893.

Already over half the places have been applied for, and any of our readers who are desirous of taking part in these trips should send in their application to the Polytechnic without delay.

Mr. Douglas Hogg (the son of Mr. Quintin Hogg, the president of the Polytechnic), and Mr. Mitchell, the secretary of the Polytechnic, leave England shortly to complete the Trans-Atlantic arrangements.

Last year special series of excursions were run to Norway, Madeira, the Ardennes, Switzerland, &c., and during the last three years over 9,000 persons have participated in the excursion arrangements of this well known Institution.

## PHOTOGRAPHY IN THE TROPICS.

BY PROF. S. W. BURNHAM.

A few suggestions may not be out of place bearing upon the practical side of making photographic negatives in the damp and hot regions of the West Indies and the northern part of South America. The same conditions seem to prevail for at least twenty or thirty degrees of latitude. Heat and dampness have been considered to be conditions most dangerous to the keeping of dry plates, and manufacturers frequently caution purchasers to keep the plates in a dry and cool place. One who has not visited such a place cannot understand the excessive dampness which pervades everything, and the extreme discomfort produced by temperature even lower than 90°. Clothes and shoes mould over-night in the sleeping-room, and nothing ever seems to get dry, except the new-comer, whose thirst is perpetual. If these conditions had been fully considered before leaving home, the boxes of plates would have been packed in such a way as to exclude them from the outside air; but this was not done, and until the plates had been repeatedly tested, it was feared that they might have received some injury. As soon as possible after arriving at Cayenne, a dark room was made for developing, and a large number of plates, which had been exposed about Cayenne, and before reaching there, were developed. There was no evidence of any kind that the plates had suffered any deterioration. The negatives made and developed at this time, though substantially all instantaneous exposures, were both creditable to the excellence of the Seed plates, and gratifying to the photographer. Several boxes of unexposed plates were brought back, and these, when used, appeared to be in their original condition. Some 8 by 10 plates exposed in Trinidad, on the return trip were placed in a box containing two unexposed plates. When we journeyed to Mount Hamilton, the two unexposed plates had been forgotten, and one of them was placed in the developer. No image appearing, the tray was placed on the rocker and the development was kept up for at least an hour, and perhaps for an hour and a-half. Then the true state of the case was suspected, and the plate was rinsed and put away to dry. Some days later it was put in the camera and exposed, and as fine a negative made of the large telescope as any one would wish to have. This certainly could not have happened with either a poor plate or a damaged one.

With the chemicals the change was apparent. The sulphite of soda, though taken in the original bottles as sealed by the manufacturer, had absorbed so much moisture that that which was originally a fine powder had become a solid mass, which could not be dug out of the bottle with a sharp steel implement, and could only be broken up by first breaking the bottle. The carbonate of soda fared much the same way, notwithstanding the packages were in their original sealed condition; and the hyposulphite of soda continued to absorb so much moisture that there were always in the vessel in which it was kept several ounces of a saturated solution. Of course in such a state the usual quantities of carbonate and sulphite of soda, weighed for making up developer, became quite uncertain from the addition of an unknown quantity of water; and the best way of developing with the chemicals in this condition was thoroughly learned by making a great many exposures in and around Cayenne, and experimenting in the development until the best proportions were found. In going to a climate like this, all chemicals which have a tendency to absorb moisture should be carefully sealed with wax, or in some other way made air-tight, and particularly hyposulphite of soda, which should be hermetically sealed in a substantial package; otherwise this chemical will become saturated, and the excess of water wil escape, if possible, and perhaps damage other things. Of course plates, and chemicals which might injure them, should never be packed in the same box. It is always better to take the necessary developing materials and develop the plates as soon after exposure as possible. Many things will spoil an undeveloped plate which would not injure a negative. This is with reference to the ordinary landscape views.

For special exposure and photographic work of particular value, it goes without saying that the plates should in all cases be developed on the spot. There is nothing to lose by this course, and everything to gain. To say the least, it is dangerous not to do it; and no one would pretend to say, after developing a flat and weak negative, which had been transported a long distance after exposure, that the result would not have been entirely satisfactory if carefully developed at the first.—*American Journal of Photography.*

## SOCIETY OF ARTS.

### Sessional Arrangements.

The first meeting of the one hundred and thirty-eighth session of the Society will be held on Wednesday, the 18th November, when the opening address will be delivered by the Attorney-General, M.P., Chairman of the Council. Previous to Christmas there will be four ordinary meetings in addition to the opening meeting. The following arrangements have been made:—Prof. Silvanus P. Thompson, F.R.S., "Measurement of Lenses"; Mr. G. H. Robertson, "Secondary Batteries"; Mr. James Dredge, "The World's Fair at Chicago, 1893"; Prof. Vivian B. Lewes, "Spontaneous Ignition of Coal, and its Prevention"; Mr. E. Price Edwards, "Burning Oils for Lighthouses and Lightships"; Mr. T. Pridgin Teale, "Dust, and how to shut it out"; General Pitt Rivers, "Typological Museums"; Mr. T. Anderson, "Iceland"; Mr. J. W. Tonks, "Artistic Treatment of Jewellery and Personal Ornament"; Sir William Wedderburn, Bart., "Agricultural Banks for India."

*Foreign and Colonial Section.*—Meetings on Tuesday afternoons at 4.30—January 19th, February 16th, March 15th, April 5th and 26th, May 24th.

*Indian Section.*—Meetings on Thursday afternoons at 4.30—January 21st, February 11th, March 3rd and 24th, April 28th, May 19th.

*Applied Art Section.*—Meetings on Tuesday evenings at 8—January 26th, February 23rd, March 8th and 29th, April 12th, May 17th.

*Cantor Lectures.*—Monday evenings at 8:—Mr. A. P. Laurie, "The Pigments and Vehicles of the Old Masters" (three lectures), November 30th, December 7th and 14th; Prof. George Forbes, F.R.S., "Developments of Electrical Distribution" (four lectures), January 25th, February 1st, 8th, and 15th; Prof. William Robinson, Mem.Inst.M.E., "The Uses of Petroleum in Prime Movers" (four lectures), February 29th, March 7th, 14th, and 21st; Mr. Bennett H. Brough, "Mine Surveying" (three lectures), March 28th, April 4th and 11th; Dr. Percy Frankland, F.C.S., "Recent Contributions to the Chemistry and Bacteriology of the Fermentation Industries" (four lectures), May 2nd, 9th, 16th, and 23rd.

*Howard Lectures.*—A special course of six, under the Howard Bequest, will be delivered on the following Friday evenings at 8:—Prof. W. Cawthorne Unwin, F.R.S., "The Development and Transmission of Power from Central Stations," February 5th, 12th, 19th, and 26th, March 4th and 11th.

*Juvenile Lectures.*—Two lectures, suitable for a juvenile audience, will be delivered on Wednesday evenings, January 6th and 13th, at 7 p.m.

*Chicago Exhibition,* 1893.—The Council of the Society have been appointed a Royal Commission for the Chicago Exhibition, 1893. All applications for space in the British Section, and all inquiries for information about the Exhibition, should be addressed to the Secretary of the Royal Commission, Society of Arts, Adelphi, W.C.

London and Provincial Photographic Association.—Nov. 19th, competition lantern slides; Nov. 26th, "Protection of the Negative Film during Printing"; Dec. 3rd, "The Exaggerated Perspective of Wide-Angle Lenses." Visitors invited.

South London Photographic Society.—The third annual exhibition of photographs by members will be held at Hanover Hall, Hanover Park, Rye Lane, Peckham, on Monday and Tuesday, November 16th and 17th. Transparencies will be shown by aid of the oxy-hydrogen light. Open on Monday from 7 till 10; on Tuesday 3 till 10. A selection of instrumental music will be given during each evening.

Detected by the Camera. — Science is pressed into the detective service more and more. At one time it is chemical analysis, again it is the phonograph, and anon it is photography. A striking illustration of the latter application has occurred in Paris. Two Parisian dressmakers, on entering their rooms the other night, found that their door had been broken open, and that 2,000 dols. in bank notes and a box containing 4,000 dols. in notes and jewellery were missing. The arrest of the thieves—three men and two women—and the recovery of the greater part of the property appear to have been due to a "detective camera." An amateur photographer lives opposite the dressmakers. He, looking out of his window one afternoon, observed two young women on the balcony over the way. With his camera he took an instantaneous photograph of the two strangers and closed the window. Some days later, on hearing of the robbery, he sent a print of his photograph to the police, who recognised the portrait as that of two women who frequently loitered in front of the Central Market. They were arrested, and gave the names of their accomplices. Whether the motive of the young man who took the photograph was one of curiosity, or whether he had a suspicion that the young ladies were thieves, is not stated, but in any case the result was one to be thankful for.—*Baltimore Sun.*

## Notes.

Old beliefs and superstitions are, like cats, hard to kill, and if it be true that the latter are so tenacious of existence because they possess nine lives, the former must surely have nine hundred chances of escape from oblivion. As a case in point, let us instance the belief that a change of moon—which, in reality, amounts only to a change of aspect as seen from the earth—will lead to a change in the weather. This belief was knocked on the head long ago by certain scientists who made records for many years, and who showed conclusively that there was no solid foundation for it.

Happily, there are not many photographic misconceptions of this kind which need overthrowing, but there is one which turns up at intervals with wonderful regularity. It comprises the belief that, when a man is struck by lightning, a natural photograph of the tree under which he was standing at the time is impressed upon some part of his body. The most recent incident of this kind was lately reported in an American paper in the following words: — "*Photographed by Lightning.*—When Charles Tunnison and Ed. Caldwell were killed by a stroke of lightning at the ball game at Warren, O., they were sitting beneath a tree. On the chest of Tunnison, the white man, the undertaker found photographed, apparently by the flash upon the skin, the image of a branch of a tree and its twigs. The strange freak is the talk of the town."

It will be observed that the picture is seen upon the white man's skin, and not upon that of the nigger, and here we have at once a clue to the origin of the so-called photograph. The tremendous energy of the electric flash often so affects the capillary vessels in the human subject that extravasation of the blood is brought about. In other words, the blood is urged out of its usual channels and makes a kind of foliated marking beneath the skin. In appearance the picture is more like that of a delicate fern leaf than of a tree, but it is quite sufficient to give origin to the common belief that it is a representation of the veritable tree under which the unfortunate bearer of the design stood when he met his death. The story is occasionally varied so as to include the surrounding landscape as well, but this addendum is, of course, the natural result of exaggeration as the wonderful occurrence is repeated from one person to another.

It is now a matter of history that, during the siege of Paris, communications were maintained by means of pigeons, who carried photo-micrographic despatches. This system laboured under the disadvantage that the birds might be shot in transit, so another aerial messenger is being educated for the work. A distinguished bee-master of the Gironde has found that the busy honey-gatherers under his control are most sagacious in finding their way back to the hive from long distances, and he proposes to attach to the thorax of the insect, by means of fish glue, a tiny despatch which will in no way impede its movements. If such a plan be really practicable, there will, of course, be no difficulty in the photographic part of the scheme. A photo-micrograph on thin celluloid would, perhaps, be the most convenient form for the missive to take.

The Paris police have hit upon a plan of preventing costermongers transferring their licenses from one to another, and so evading the fee. They now compel every coster to be photographed, and present him with a pocket-book for keeping the photograph in, which has to be produced when evidence of identification is wanted. This is a new amplification of an old idea.

The bequest of an imitator of those proprietors of infants' food who offer prizes for the photograph of the finest baby brought up on a particular form of diet, is exercising the minds of the Parisian art critics. They greatly fear an epidemic of the baby and "Kiss Mammy" fever, which is so characteristic of English art. The bequest consists of a sum of money, left by a picture-collector named M. Piot to the Académie des Beaux Arts, to be awarded to the sculptor or painter who shall produce the best representation of a nude child between the ages of eight and fifteen months. As one competition is open to foreigners as well as native artists, English painters should have a good chance, judging, at all events, from their practice in babydom.

The ways of the Post Office are mysterious. If anything be pasted on a postcard, the officials consider it "contrary to regulations," and refuse to deliver the post-card in question, though the additional weight may be infinitesimal, and certainly not nearly equal to half the weight of a half-ounce letter, which is taken for a penny. A short time ago a candidate for Parliamentary honours conceived the idea of sending to each elector a card in the shape and form of a reply postcard, giving his photograph and address, the outside being reserved in due form for the name. The Post Office authorities objected to take the cards at the usual rate, whereupon the candidate sent them over to Paris, whence they were sent and delivered in England for a five centime stamp. As the distribution of photographs during election contests is becoming very popular, the Post Office, perhaps, may think fit to alter its "regulations," as, according to the present rule, it is throwing away what might be a very respectable addition to its income.

Prince Albert Victor inherits the taste for collecting photographs which Her Majesty displays in so marked a degree. In the Prince's rooms at Sandringham he has a very large number of portraits, and another five hundred or so at Marlborough House. When the fire broke out at Sandringham, his chief anxiety was to know whether his photographs had been burnt, and, no doubt, was much relieved when intelligence of their safety reached him.

The Queen's series of albums must contain many thousands of photographs of notabilities, from the portraits of kings, queens, emperors, and empresses, downwards. Such a collection as time goes on should prove invaluable, and, if reproduction of all in some permanent process be impossible, a selection might be made which would be well worth preserving for the information of future generations. As Her Majesty has been collecting since the early days of the Daguerreotype, her store must be thoroughly representative of the progress of photography. Unfortunately, time is no respecter of photographs, Royal or otherwise, and many of the most interesting must show signs of the sere and yellow leaf. The collection would justify the appointment of a Royal photographer, one of whose duties it would be to watch the collection, and copy those which are considered worthy of preservation before they fade.

## THE PALL MALL EXHIBITION.

We have now to give some account of the pictures which are hung upon the screens, and we have to make the same complaint to which others have called attention in former years, with regard to the bad light in which some of these pictures are hung. This applies more especially to those pictures which are placed upon the square screen which surrounds the lantern platform at the end of the room. We may say, indeed, that on only one side are the pictures efficiently illuminated, the other three sides being in semi-darkness; hence it is almost impossible to see their beauties, and to criticise them fairly. The late season of the year in which the Exhibition is held of course aggravates the fault, and on some of the dull afternoons with which we have been lately favoured, it has been next to impossible to see whether the pictures on the shady sides of the screen are good, bad, or indifferent.

Mr. F. Thurston exhibits two pictures in carbon, Nos. 544 and 545; these are both similar subjects to those which Mr. Thurston has previously exhibited, one of which, we remember, took a medal at a former exhibition. They are views of those picturesque roads which are so common in this country of ours; roads over which the elm trees arch, and make such picturesque photographs. One of these is called "Changing Pastures," and is relieved by the figure of a shepherd and a flock of sheep; while the other one is a similar subject, over which the mantle of winter has fallen, both road and trees being covered with snow. A more attractive picture from the same hand, and of quite a different nature, is a bromide print (No. 567), entitled "The Bridesmaids." Here we have a file of half-a-dozen demure little maidens in the 18th century costume, bearing baskets of flowers. This is quite a pretty little gem, upon which the photographer may well be congratulated.

In No. 546 the Woodbury Company exhibit a variety of examples of the new adaptation of Woodburytype printing, which has recently become familiar in illustrations to various books under the title of "Woodbury-gravure." These prints show at once to what perfection the Woodbury process has attained, and they differ from the gelatine pictures originally produced by this method of photography in that the pictures are printed direct upon the mounts, so that what was once a serious obstacle to the employment of Woodbury pictures—we mean the careful mounting required—has now altogether disappeared. This simplification of a beautiful process is sure to extend greatly the use of this system for book illustration.

Nos. 547 and 548 are two pictures by Mr. J. E. Dumont entitled respectively, "The First Lesson," and "The Dice-Players." The composition of both pictures is clever, and the subjects have something new about them.

Messrs. Perkins and Sons exhibit in frame No. 549 a number of admirable views of the streets of London, taken, of course, instantaneously.

Mr. A. Debenham's four studies of yachts under way (No. 550) merit notice because of their breezy nature, and the representation of motion which they have.

Mr. H. B. Lemère has always been to the fore with views of interiors, and he seems to have devoted himself more especially to this by no means easy and very effective kind of photographic pictures. In the frame which he sends to the Exhibition are several excellent examples of his work, the most noteworthy, perhaps, being the view of a theatre at Newcastle, a view taken from the stage, and admirably lighted.

Mr. J. Collier, of Birmingham, sends a couple of beautiful panel portraits (Nos. 559 and 560), as well as a frame of cabinets, which cannot but add to his reputation.

In No. 562 Mr. Stern takes us far away in his clever pictures of Eastern types of humanity. Of these we may mention, for their excellence, a Tunisian water-barrow, a Tunisian Jewess (fatted up for the marriage market, as is customary among these ladies), a Bisharee Arab, a Trapist monk, a negro musician (a real one, not one of the counterfeit kind that we see at home), and, lastly, a Greek peasant.

Mr. Marsh exhibits on this screen, in Nos. 563 and 569, two of his very fine seascapes, both printed in carbon.

Crossing now to the screens at the other end of the room, we must first notice another frame of pictures by Mr. Stern (No. 572), in which are exhibited photographs of Japanese treasures, consisting of ivories, bronzes, china, &c., all treated in that quaint and artistic manner which is common to Japanese work. Messrs. Window and Grove show a number of clever cabinet portraits on this same screen, while Mr. H. Baker exhibits six fine portraits of sepia tone, printed in carbon. It is a pity that here, again, we have a paucity of light, by which the pictures suffer considerably. The works on the other side of this screen do not suffer from the same disadvantage, so that we are able to make a more minute examination of the fine portrait of our contributor, Mr. H. P. Robinson, by his talented son. There are also here some very good examples of pictures produced on Obernetter paper toned with platinum; these are excellent examples of photography by Mr. J. K. Taylor.

Mr. Brownrigge, the veteran photographer, sends a capital view of Watcombe Bay, in the Isle of Wight, famous for its cliffs. The view is an admirable one.

Mr. F. L. Colls has deservedly won a medal for six copper-plate photo-etchings. These will be familar to many, because they have appeared in "Sun Artists." The most noteworthy, perhaps, are the "Water Rats," by Mr. Sutcliffe, and the beautiful study of "Sand-dunes," by Mr. Wilkinson. Messrs. J. Russell and Sons have some more of their "at home" portraits on this screen, and these naturally attract attention, as they are portraits of Royal personages.

Some frames of pictures of very great scientific interest are shown here by Dr. Jeresrich; these consist of photo-micrographs of blood, indicating, by the difference in number and size of the corpuscles, the differences between that of the human subject, the pig, and the monkey. There are also shown similar pictures of hair. The possibility of obtaining photographs of such subjects will show how valuable photography is likely to be in medical jurisprudence. We need no longer take the word of a medical man for certain appearances, but the pictures can be handed to the jury, who will be able to form their own conclusions. Of the same nature are some photo-spectrographs, showing the difference between arterial and venus blood, before and after treatment with reducing agents. The same talented experimenter also shows a number of illustrations of detection of forgery by photography. For instance, we see first the photograph of a document taken by ordinary means, then in another picture we see the same treated by Dr. Jeresrich's method, showing how the writing has actually been altered. In one example figures have been falsified, and the means by which this has been done is plainly shown by the different tone of the ink which the forger has used upon the material, and in another case how the original signature has been obliterated and written over by a new one.

Turning to the apparatus section of the Exhibition, we must first notice Mr. Bruce's aerial graphoscope. This consists of a flat lath of wood about four feet long, and two inches broad, and painted white, upon which the image, projected by a lantern, can be thrown, while the lath, by attached gearing, is rapidly rotated in a dark room. The picture thrown upon the moving lath appears as if suspended in mid-air. The apparatus does not pretend to take the place of the ordinary lantern screen or sheet, but is a most admirable device—perhaps the most perfect one which has yet been made—for showing the phenomena connected with persistence of vision.

We need hardly say that the collection of lantern slides contributed to the Exhibition is a large one. Messrs. G. West and Son have secured a medal for a miscellaneous set, the chief feature of which is a collection of pictures entitled, "Sons of Neptune." Here we have pictures of sailors on board ship—at work and at play—and these, coming immediately after the successful Naval Exhibition, are sure to excite great interest.

Messrs. Oeffelein & Co. exhibit a frame of burnt-in photographs, and china vessels decorated with similar pictures by the new system, which has already been noticed in our columns.

Among the other contributors of lantern slides are Miss C. W. Barnes—whose name is better known on the other side of the Atlantic than here—who sends a number of scenes from "Etaine," &c.; Mr. A. K. Dresser, who contributes a number of instantaneous scenes taken with his cleverly-designed hand-camera; some splendid views of British scenery by G. W. Wilson and Co.; some interesting views taken at the Cape Peninsular by Mr. C. Ray Woods, the astronomer; and some beautiful transparencies by Mr. Birt Acres. These last consist of lantern slides illustrating wave studies, cloudland, sheep, &c., besides some decorative transparencies of larger size, which are full of beauty. We must not omit to mention, too, some very beautiful flower studies by Mr. J. Carpenter, included in this section of the Exhibition.

The apparatus proper does not comprise anything of a very novel character. The Birmingham Photographic Company are large exhibitors, and their dishes, plate-lifters, lamps, washers, draining racks, rockers, &c., are well worthy of attention by those who try to get the most convenient articles for their every-day work.

The little boxful of type for printing the title of pictures on negatives, called "Nameit," shown by Mr. A. Gray, is a convenient contrivance which is sure to come into common use.

Messrs. W. Griffiths and Co. also show a number of different articles, including hand-cameras of all kinds and prices. They also show their well-known lantern slide making camera in different sizes, and a clever fixed enlargement camera.

Messrs. Harris and Co. exhibit their "Cytox" hand-camera, with a wonderfully clever and simple changing apparatus, by which the last plate exposed is, by the touch of a button, relegated to a well in the base of the instrument.

Specimens of thio-carbamide reversal pictures are exhibited by Col. Waterhouse.

The London Stereoscopic Company show four different types of camera, the most noteworthy of which is the twin artist's hand-camera, the word "twin" referring, not to the operator, but to the fact that the camera employs two lenses, so that whilst one is actually employed in taking the picture, the other—of similar focus—forms the image, which can be watched at the same moment.

Another medal in the apparatus section has been awarded to the Paget Prize Plate Company for a very ingenious glass cutting machine. This can be worked by the hand or by power, and will cut dry plates at a great speed. The only fault that we should be inclined to find with the clever machine is, that it is apparently designed for cutting plates on the glass instead of the film side. It is generally agreed, amongst those who have had much to do with dry plate manufacture, that they should be cut through the film, for the reason that the gelatine surface is not apt to be striped when the glasses are finally divided, and there is less liability to fragments of glass getting detached, and doing mischief during the packing of the plates.

Messrs. Ross and Co. show a case of their well-known lenses, as do also Messrs. J. Swift and Sons.

We were interested to observe that Mr. J. Gaedicke exhibits a number of negatives taken by his new rapid collodion dry plates. We are presently expecting that plates of this character will be put on the English market, and there is naturally a good deal of interest aroused respecting them. It remains to be seen whether the revival of this old method of producing dry plates, with the property of rapidity added to their well-known advantages, will affect in any way the popularity of gelatine plates.

Photographic Veneering of Furniture. — In the application of photographs to cabinet-ware, Mr. J. K. France has patented the use of a substance that he calls "pyralin, or some other compound of pyroxyline." The print is fixed by means of alchohol. It is applied to the wood to be decorated, and the surface polished by pressure on a metallic plate, or by other means. This invention has for principal object the veneering of furniture.

Sheet Glass from Molten Metal. — The present practice in making metal sheets is to cast ingots or slabs, and then reduce these by repeated rollings and re-heating. Attempts have been previously made to produce sheets directly from the molten metal by pouring the metal: (1) between two revolving rollers; or (2) between a revolving wheel and the surface of an enclosed fixed semi-circular segment. By these means none but very thin plates could be satisfactorily produced. In a new invention the machinery consists of a large receiving roller of 5 feet diameter, more or less, and of a length equal to that of the plate to be produced. With this are combined small forming rollers arranged in succession part of the way round the periphery of the large roller, and revolving at the same rate as the large roller. The rollers can be cooled by a current of water circulating through them. The molten metal flows on to the surface of the large roller, and is prevented from escaping sidewise by flanges with which the large roller is provided. These flanges embrace the small rollers, and are of a depth greater than that of the thickest plate which it is proposed to roll. The distance between the large roller and the small rollers can be adjusted according to the desired thickness of the plate. When dealing with metals of a high melting point, such as steel, the first small roller is made of a refractory material, and is heated from the inside by the flame of a blow-pipe. The rollers are coated with plumbago or other material to prevent adhesion to the molten metal. In case of metals of a high melting point, the machine is fed direct from a furnace divided into two compartments by a wall, or bridge, in which is a stopper, which can be operated so as to regulate the flow of metal. When applied to forming sheets of glass, the rollers should be warmed by a blow-pipe flame, and the sheet of glass stretched and annealed as it leaves the last roller.—*Oil, Paint, and Drug Reporter.*

## PHOTOGRAPH FRAMES.

BY JAMES MEW.

There is a game, with which certain chalked diagrams on our pavements have made most people more or less familiar, endeared to children by the name of "Hop-Scotch." This game is not, as some rash etymologist might in his haste affirm, originally, or in any way, connected with Scotland. The latter portion of the word is, perhaps, a variant of *skotch*, related to Lady Macbeth's "We've *scotched* the snake," and refers to those geometrical figures upon which the sport of hop-scotch depends for its existence. In this game a stone is driven by the foot of a hopping player, under certain rules and regulations and by-laws, from one compartment to another of a design drawn on the ground, until the final compartment is attained, which feat awards the laurel to the player's brow. This last compartment—the chamber, so to speak, of successful endeavour, the final goal of ardent enterprise, the ultimate haven of emulative aspiration, the *summum bonum* of supreme content —has been thought worthy of a particular name, which is usually inscribed in its midst. It is a homely word, not high sounding, nor sesquipedalian, nor of foreign growth, this word representing hope's fruition. It is *Pots*. This *Pots*— sometimes called *London*—it is the object of the ambition of every artist, in his own particular business, to attain. In a humble way, the manufacturer of photograph frames is continually striving to reach some device which will attract and please the public taste ; he is, in other words, hoping, if not hopping, to reach the final goal of *Pots*. Nor is his course direct ; he proceeds—as is the custom in the game of hop-scotch—after a zig-zag fashion. Now he will tarry for a time in the room of sweet simplicity, and then suddenly pass over into that of florid adornment. Now his margins will be thread-like in their thinness, and then they will assume such ample proportions that the photograph appears in them like a few lines of the Talmud surrounded by its folio page of commentary—a tiny pool of text bordered by a mighty meadow of notes on every side. Now his frames will simulate gold or silver, and then ebony or ivory. Now a frame of molten brass will please him, and then a frame of white enamelled wood.

The primary purpose of a frame is, it may be assumed, to protect the work of art which it encloses. To preserve the result of all his labour which he takes—under the sun —is the natural desire of photographic man. One of the saddest things about the profession of the screever—the artist on stone who ornaments our highways with crayon drawings of mountain scenes and mackerel and sunset of no inconsiderable skill—is that his works cannot last. It is for him, indeed, in this climate, "a hard struggle with the rain"—a pathetic appeal to charity sometimes written by him round his pictures. But even should the rain-water spare his work, its life, nevertheless, at the most is that of a day. As a dying man is forced to leave all the riches he has gathered together when his soul is required of him, so, with the coming shadows of evening, must the sorrowing screever also depart, and allow the work on which he has bestowed such scrupulous care—surrounded, indeed, by a frame, but such as no hands can carry away—to be effaced by the foot of the belated drunkard or the night-walking policeman.

The primary purpose of a frame is to protect and to preserve. The photographic artist and the purchaser of his work are, perhaps, equally anxious, one to save the value of his labour, the other of his money. To withstand the attacks of discolouration and decay, to set up some rampart against smoke and damp and dust, which break through the careless, perfunctory connection established between thin paper and defective glass, and steal away from us faces which no camera, by any carte-de-visite or cabinet, can ever in this world restore, is the main object of the frame's invention. A secondary purpose of a frame is to detach a picture from its surroundings, and so to give it greater prominence. The neat gold beading—which, though glittering, is not always gold—the neat gold beading which can be placed round your photograph—if you are of such a complexion as to desire it, and your patience holds out—while you wait, suffices to cut it off by a shining barrier from all meaner pictures, as well as from the world of wall on every side of it. A third purpose of a frame is to ornament, and here caution is required that the decoration be not excessive in quality or quantity, lest it overpower the enclosed picture, and the scoffer may say that the frame is the principal consideration, and that, instead of the frame being for the photograph, the photograph is for the frame. A taunt of a similar nature may be sometimes applied to the purchasers of magnificently bound books; it is notorious that these gaudy volumes are always less read in exact proportion as their bindings are more rare. Men, too, like books and pictures, when set in a golden frame, may excite attention and regard, while without such a frame they would remain quite unnoticed. And the curious observer, looking upon the reverse sides of these frames which enclose humanity, where his eye is not dazzled by the golden glory, may discover many hidden imperfections ; just as, in the back view of our picture frames, we see nothing but boarding and brown paper, and dust, and tacks, and string, and glue.

In almost every photographic exhibition, in our own country and elsewhere, we find the critic, or special correspondent, or commissioner, falling foul of the frames which enclose the photographs submitted to public censure. In almost every exhibition of pictures are noticed some that show exceptionally bad taste in framing. Sometimes the frame is too large, sometimes too small ; sometimes it enfeebles, and sometimes distracts attention from the photograph. According to the precept which the wise Polonius endeavoured to character in the memory of his son Laertes, that "the apparel oft proclaims the man," the nature of the frame has occasionally gone far to determine the merit of the picture. A great allowance must, however, be made for divergency of taste, that indefinable something which has so much to do with matters of this nature. If we could ever hope to obtain any agreement of taste, the possibilities of method of framing are so varied and manifold that a suitable border for any kind of photograph would never be lacking ; for the numbers of photograph frames are as the number of human vices, and the permutations and combinations of frames are legion. They may be made, for instance, of metal, or wood, or glass, or ivory, or leather, or cloth, or silk, or stone, or plush, or card, or canvas, or porcelain, and very probably of many another stuff, either singly or taken two or more together. The metal, again, may be steel, or copper, or bronze ; the wood may be oak, or ebony, or rose, or mahogany, or maple ; the leather may be morocco, or roan, or Russia, or basil ; and the silk may be of as many or more variations.

The form of frames may be oblong, corresponding to carte-de-visite, cabinet, imperial, or panel, or square, or oval, or circular, or polygonal, or of some other geometrical figure. The frame may represent any object of art or nature, from an easel to an elephant. It may be of that "spiky and attenuated order of art," as it was called by a gentleman who disapproved of it, in which four rods with projecting ends are crossed at right-angles, and fixed with four very prominent nails, a variety known as the "Oxford frame"; and it may be of a kind, to another critic, in the words of Dogberry, "most tolerable and not to be endured," with a margin covered by a shiny black pigment laid on the glass and edged with a band of gold, recalling the Death of Dido, the Birth of Pyrrhus, the Lindor and Clara, and other works of the industrious Bartolozzi.

The varieties of frames in metal, leather, wood, and silk are variously sub-classified. Under the *genus* metal is the antique pierced and the *répoussé*, the electro-plated and the varnished; under leather is the smooth and the embossed; under wood, the carved and the white enamelled; under silk, the brocaded and the *broché*; and under glass the plate, the plain, and the silvered. Frames run through the whole gamut of colour. So-called new colours are commonly found to sell the best. In the matter of ornamentation, novelty is the most palatable sauce—the new ever communicates a relish. The old world saw the gilt compo flourish and fluting scroll and scallop which adorned its pictures, and was glad; but all these devices of elaborate ornament have become an inelegance and an eyesore to the people of the present time. Where ribbon, cross, or volute was once commonly set in corners to conceal the joints of the frame —joints which, nevertheless, made themselves, in the course of time, sufficiently conspicuous by cracking the compo more or less exactly in their line of direction—we now meet with butterflies, or flowers, or birds.

Ingenious devices known as illuminations abound in the pages of albums, which are so many frames. They are also met with on another kind of frame called the photographic screen. These frame devices should—in the estimation of some good folk—be in some way connected with the photograph they enclose. Dickens' Mr. Pecksniff should not, they opine, be found on a page having the same ornamental frame as that which enshrines the parson of the parish. Semblances of swords and cannons ought not to surround the effigy of a member of the Society of Friends, however suitable they might be to the portrait of a gentleman in the army; and a scroll, and angel, if not a trumpet, seem inappropriate to a son of Mars, though possibly fit and proper round a disciple of St. Paul.

The adaptation of frame to subject is in many cases suggested, if not enforced, by the unerring instincts of our common human nature. It is clearly felt that the same frame cannot always suit the same portrait. In a world of mutability, the relation of the photographic frame to its contents cannot remain constant; it varies, indeed, as the fashion of a woman's dress, the condition of her temper, or the width of the black hat-band which advertises to a sympathetic public our degree of grief for the dead. Before dear, good Uncle Jones carried off his many virtues, which we never tired of recording, into that four-square city with the jasper wall and jewelled foundations and gates of pearl, his venerated portrait hung in our front drawing-room, framed double-gilt with best English gold. No frame, it was felt by us all, could be quite good enough for the picture of that good man. But when, in the fullness of time, it was discovered that the wicked old fool Jones had left all his money to that designing minx, his housekeeper, Miss Robinson, we with one accord relegated him to the nursery, where his benevolent old face still simpers out of a leather frame bought for fourpence halfpenny at the stores.

Some men there are who love not a gaping pig, and to others the bare backs of photographs are indecent. These say that if a photograph is to be framed at all it should be framed completely. Hand-painted flowers, with poetical mottoes attached to them, have been thought by their presence to improve the hinder portion of a photographic frame. The severity of some people in this matter recalls the opinion of him who would have no pictures save those which "created feelings of repose, peace, and purity." All representations of "martyrdom, nude figures, or anything of a repulsive nature" had no place on his exclusive walls.

With the eccentricity of this gentleman may be compared that of another, of a mathematical turn of mind, who often advised with his pillow with regard to that much vexed matter of depth of frame. Some people are herein content with a very simple rule. They make the extent of frame in direct proportion to the value of the picture; that is to say, a picture worth £300 should, they say, have a border just six times the breadth of one worth £50. As this reference of width to value is clearly unsatisfactory, a correspondent of the *Art Journal*, some five and thirty years ago, conceived the remarkable and original idea of framing pictures in harmonic proportion. Quantities are in harmonic when their reciprocals are in arithmetical proportion. The idea, he tells us, was so much to his own satisfaction in the execution that he thought never again to disregard it. Starting from the principle that harmony of form is as weighty as harmony of sound, he produced the following equation, where $a$ stands for the length and $b$ the breadth of the picture, and $x$ the third harmonic proportional:—

$$x = \frac{ab}{2a-b}$$

Thus, in a picture 6 inches long and 4 inches broad, a width of frame of 3 inches would, he considered, be all that was desirable. If the harmonic third gave too weighty a frame in a large picture, its half, or even its fourth, might be substituted without spoiling the proportion. When the picture was square, some mathematical difficulties followed, with which the reader need not now be troubled.

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

18,420. Ernest John Humphrey and William Henry Smith, 11, Southampton Buildings, London, "Improvements relating to the Production and Use of Artificial Light for Photographic Purposes, and to Apparatus therefor."—*October 26th.*

18,528. E. H. P. Humphreys, 8, Hyde Park Gate, London, "An Improvement in Photographic Shutters."—*October 28th.*

18,529. E. H. P. Humphreys, 8, Hyde Park Gate, London, "A Movable Photographic Dark Slide Holder."—*October 28th.*

18,564. Thomas Foster Wood, 9, Westbury Park, Bristol, "Photographic Rocking Apparatus."—*October 28th.*

18,592. Eugen Hackh, 115, Cannon Street, London, "Improved Device for Photographing in Bound Light."—*October 28th.*

18,702. Ann Van der Werff, 54, Fleet Street, London, "A New or Improved Focussing Cloth and Mask for the Use of Photographers, and for like purposes."—*October 29th.*

18,786. Charles Cheetham Vevers, 12, Market Street, Briggate, Leeds, "Improvements in Developing Dish Rockers and Screens."—*October 31st.*

### Specifications Published.

18,238. *Nov. 12th*, 1890.—"Photographic or Camera Guns." C. Lawrence, 141, Fulham Palace Road, London, S.W.

This consists in a photographic or camera gun, which, on being pointed to a moving object, will photograph the same on a suitable film or plate by the operation of a trigger attached to the butt of said gun, thus exposing the plate or film. The camera is hinged to the butt, and contains the plates, which are arranged in book form, each plate being retained in a suitable frame, which frames are hinged together at one of their sides in such a manner as to allow of their being exposed. The plates are changed by mechanism operated from outside the camera. In conjunction with this camera gun, a suitable shutter is provided, cousisting of wiugs operated by means of a clock spring and toothed wheels, operatiug a revolving disc through the medium of convenieut levers, which enables an instantaneous exposure, or one of any desired duration, to be given. This shutter is placed betweeu the camera box and a barrel containing the lens, which is adjusted in the barrel by rack-and-piniou motiou. Sighting mechanism is also provided on the barrel, aud, if desired, an indicator, operated by the falling over of the frames coutainiug the plates, may be used, thus indicating on a dial the uumber of plates exposed.

19,358. *Nov. 28th*, 1890.—"Photographic Dishes." E. S. Norcombe, 97, Islington Row, Birmingham.

A photographic dish which allows of negatives or positives being washed and examined during the process of development, without removal from the dish by meaus of implements, or injury to the fingers from the developing liquid. It consists of a dish made of transparent glass, or otherwise, with a groove inside parallel with the bottom, on two or more sides, which, when the dish is held up with a picture in, either to drain off the liquid or to examine the development, secures the picture from falliug out, as the picture necessarily slips down into the grooves of the lowest angle when the dish is raised. The same object may be effected by using rows of nipples in place of the grooves.

19,402. *November 28th*, 1890.—"Improvemeuts in Producing Photographs, and in Optical Lanterns for Displaying them." A. W. Scott, Ashcombe Road, Weston-super-Mare.

The object is to photograph persons, objects, scenes, aud complicated dioramic effects, and to project images of the same on to a screen by a limelight, either iu a siugle colour or in its true colours as desired, and consists in photographing the object in three or more images, each produced by rays of light of one colour on a sensitised plate, and then projecting it ou to the screen, and in causing the images to exactly register on the screen so as to show a single image in its true colours, or in any colours, or in light and shade. The object is photographed in four places on the same plate, each photograph being produced by rays of light of one colour only—viz., red, green, blue, and violet—the rays of light from the other colours being stopped by coloured plates or other means. Each photograph is produced by a separate lens or combination of lenses, the diaphragms in the lenses being proportioned according to the sensitiveness of the plate. The four lenses are immovable with respect to each other, and the camera is provided with partitions to prevent the rays of light passing through one lens from affecting the other images, and are operated together, and are covered by one large cap, so that all the images are exposed the same length of time. The plate is developed, and a positive obtained from it in black and white apparently destitute of colours. The lantern for projecting the four images on to the screen so that they form one picture is provided with either the same set of leuses used for obtaining the said images, or with a similar set behind which is a weak focussing lens, and then the plate containing the images to be projected on to the screen. The lantern also comprises a condenser consistiug of a frame of four convex leuses, a frame containing the four coloured screens which impart the same or other desired colour to rays emauating from the image as those by which it was originally taken, and the ordinary lantern condensers throwing parallel beams of light, behind which is arranged a powerful limelight.

---

Messrs. Walter Griffiths and Co. have appointed the Fry Manufacturing Co. as their Londou agents. The Company will be prepared to give every information, and will supply goods from stock on terms that will save cost of carriage to London from Birmingham.

Photography in the Colours of Nature.—The search for the philosopher's stone or for the universal solvent was not pursued more earnestly or with more eager hope for its success by the mediæval alchemists than has been in our own time the effort to find some photographic process by which the infinitely varied and beautiful colours of nature may be fixed and reproduced. That this intense desire is not confined to photographers and other scientists who understaud the difficulties in the way is shown by the eagerness with which the public have always received each new anuouncement of the discovery of "photography in natural colours." For there have been many false alarms—many, of course, by wilful impostors, but many more by earnest experimeuters who stumbled upon chance pheuomena which seemed to point to success, but which, as in some recent instances, were but repetitions of long abandoned experiments. The fact is, however, that the long-sought problem of photography in the colours of nature has been practically solved by a Philadelphia scientist, Frederick E. Ives, whose name is already associated with more than one process and invention which have been of the greatest value in the direction of photography and photo-mechauical printing. Nor is this auuouncement of the fact a new one. Months ago Mr. Ives communicated his process and showed its results at the Franklin Institute, and he has since repeated his demonstrations there aud before the Photographic Society of Philadelphia. That the discovery has not been taken up by the civilised world with the enthusiasm which its importance warrants may be accouuted for by the fact that men's eyes have been turned in auother direction from that in which Mr. Ives has worked. It seems to have been thought that the solution to the problem could only be reached through chemistry, and yet, in the present stage of chemistry, it may be safely said the problem is as far from solution as ever it was. Mr. Ives, in his solution of the difficulty, has reached his success eutirely by photographic means, and through an exhaustive study of the laws of light, rather than of the subtle chemical peculiarities of the silver salts. Taking for a basis of his experiments a suggestion thrown out many years ago by a tutor in the household of Queen Victoria, Mr. Ives has, after years of the most laborious investigations, perfected a process which, stated very briefly, is as follows. Three uegatives are made ou the ordinary commercial orthochromatic dry plates, from the same poiut of view, one by means of the red light rays, oue by the blue, and one by the green. From these negatives positives are made, which are projected upon a screen, the three images being exactly superimposed. The light passiug through each of these positives is coloured by suitable tinted glasses, correspouding to the light rays employed in securing the negatives. These colours are automatically separated and combiued by the action of the trausparent positives, so that the resulting image on the screen appears in the colours of the origiual. If it be objected that this picture is but a transitory and unfixed lantern view, Mr. Ives answers it by producing, by an ingenious modification of his process, permanent transparent positives showing the same wonderful colour effects. When the most delicate colours iu the sky and foliage of a landscape, whether the striking contrasts of the Yellowstone or the soft beauties of forest and meadow, the brilliant and varied colours shown by the polariscope, or the intricate combinations of colour in a painting, can be reproduced with such marvellous accuracy as Mr. Ives has done, entirely by an automatic aud photographic process, it may be said that photography in the colours of nature has been accomplished.—*New York Ledger.*

## Correspondence.

"IN THE LAW COURTS."

Sir,—Allow me to express my sincere regret to Mrs. Earushaw for the misstatement which occurred in my article, "In the Law Courts," and for the annoyance which it has caused her. At the same time, you must permit me to point out, in justice to myself, that I stated in the article that the facts were taken from the report in the *Times*. The case is there reported twice —first, when it came before Mr. Justiee Vaughan Williams, and again when it was before the Court of Appeal. In both reports the facts are precisely as stated by me.

C. Fleetwood Pritchard.

6, *Pump Court, Temple, E.C., November 6th.*

FILLEBROOK ATHENÆUM PHOTOGRAPHIC EXHIBITION.

Sir,—May I remind iuteuding exhibitors that entry forms should be obtaiued at once, and returned, filled up, by Tuesday next, November 17th.

The last day for receiving exhibits is November 24th.

Joseph W. Spurgeon, *Hon. Sec.*

1, *Drayton Villas, Leytonstone, Essex, November 9th.*

A MAMMOTH CAMERA.

Sir,—In your last issue you speak of an American firm having recently delivered a camera 66 inches long, taking a plate 30 by 40. It may be of interest to your readers to know that we have been using for years past one 83 inches in length, with 26 by 20 plates, and at commencement of present year have had it enlarged, enabling us uow to work direct up to 30 by 36.

Henry Dixon and Son.

112, *Albany Street, N.W., November 9th.*

## Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting of this Society held on the 5th inst., Mr. R. Beckett occupied the chair.

The subject announced for the evening was "Treatmeut by Developmeut to Produce Variations in Density," and the Chairman showed two slips which had been identically exposed by Mr. Cowan and giveu to him to develop. The slips each showed a row of stripes, every stripe having had double the exposure of the one lying next it. By developing one slip with a minimum quantity of pyro, and the other with a full quantity, the second showed considerably denser than the first. Moreover, he thought these slips disproved Messrs. Hurter and Driffield's statement that gradation could not be altered by development. It would be found that the third stripe in the one case corresponded in density with the second stripe in the other, but, matching these alongside, it would be found that the other stripes did not coincide in density.

Mr. W. E. Debenham could not admit that this example disproved Messrs. Hurter and Driffield's proposition, inasmuch as the stripes which the Chairman stated ought to coincide, were exposed twice as long iu the one case as in the other, and it was a well-known fact that a progressive increase in exposure did not yield an equally progressive scale of density. He thought he should be able to disprove Messrs. Hurter and Driffield's proposition in another way, but that seemed to him not to come quite within the question of the evening, which was variations iu density, not variations of gradation. For getting great density, he found hydrokinone developer with caustic alkali and a comparatively large amount of bromide very efficient. For obtaining thin pictures, he had used pyro as low in quantity as a quarter of a grain to the ounce.

Mr. Cowan had developed the other two halves of the plates which the Chairman had shown. He had developed them so as to get different densities ou the two slips, but in one ease the density was about double throughout that of the other. So far as he had gone, he could not find any result contradicting Messrs. Hurter and Driffield.

Mr. J. B. B. Wellington said that, to get a hard negative, he should use a strong developer containing 4 grains of pyro, 8 of bromide, and 4 minims of ammonia, to the ounce. For a soft picture, he should dilute the developer, and reduce the proportion of bromide by half. For a dense negative for line work, he would use a slow plate and the shortest exposure possible.

Mr. F. A. Bridge said that, for a negative for block process, the development must not be prolonged, or the lines would fill up.

The Chairman enquired whether it was true that eikonogen gave a finer deposit than other developers.

Mr. Wellington thought not.

Mr. A. Haddon thought that development proceeded in two ways. Bromide of silver was reduced from the film itself, and a further quantity was reduced from the bromide dissolved in the developer. The developer contained two solvents of bromide of silver, bromide of potassium or ammonia, and liquid ammonia.

Mr. Debenham thought that it was not proved that the exceedingly small quantity of silver dissolved by ageuts so dilute had any influenee on the development.

Mr. J. S. Teape had continued his experiments with reference to reversal of image. At the last meeting, Mr. A. L. Henderson had stated that, by pouring off ferrous oxalate developer and replacing it by a fresh quantity several times, he had entirely prevented reversal of image. He (Mr. Teape) had tried that plan, and, having divided a plate into two, had developed one-half in one solution, and changed the other seven times. He found reversal to occur exactly alike in the two cases.

Subjects for discussion for ensuiug evenings were then chosen. On the 19th will be a lantern night; on the 26th, "Protecting the Negative Film during Printing" will be taken; on December 3rd, "Exaggerated Perspective by Wide-Angle Lenses." Other subjects for future evenings are, "The Best Method of Producing Lantern Slides," "Photo-Lithographic Transfers," "Treatment of Plates that have been Exposed to Light," and "Warm Tones iu Lantern Slides."

Messrs. P. Fowcard and J. Ellis were elected members of the Society.

Camera Club.

*November 5th.*—Mr. Leon Warnerke in the chair.

Dr. J. J. Acworth read a paper on "The Action of Light and Heat on the Haloid Salts of Silver." He gave a demonstration to show that the effect of heatiug bromide paper before and after exposure to a powerful light gave reversed results. Subsequently Dr. Acworth handed round specimens, and read a description of Professor Schirm's euamel-like process of printing, which had been exhibited at the last convention at Bath.

On Monday, Nov. 9th, Mr. Lyonel Clark continued the course of elementary lectures with further remarks on lenses.

Monday, Nov. 16th, will be a members' lantern evening, when Mr. T. M. Brownrigg will exhibit a selection of slides.

On Thursday, Nov. 19th, Mr. G. L. Addenbrooke will read a paper on "Aluminium and its Application to Photography."

Lantern Society.

*October 26th.* —A new oil lamp designed by Mr. Stocks was tried. It possesses several points of difference from other lamps on the market, the principal ones being that the whole of the flames from the four wicks are utilised, instead of the lower portion being obscured, and that the chimney is adjustable in length by means of a rack-and-pinion, so enabling the draught to be regulated. In the ordinary four-wick lamp, in order to get a proper flame, it is necessary to turn the wicks up very gradually, and to allow some time to elapse before getting them to their full height; in this lamp the full power is obtained in a few seconds. The lamp was tried practically against two commercial four-wick lamps, both of which give a good light as oil lamps go, and proved far superior to either, both iu purity of colour aud iu quautity of light. The experiments made tended to show that one of the chief practical advantages of the lamp would be that it might be relied on to give its full power under all circumstances.

### Holborn Camera Club.

*November 6th.*—Mr. W. Stevens in the chair.

Mr. F. J. Cobb opened a discussion on "Printing." He showed four negatives, from each of which he had taken four prints (bromide, platinotype, alpha, and silver), and gave numerous hints in working these various processes.

Mr. Golding was of the opinion that, to produce good results, a worker should be thoroughly conversant with the various printing processes now extant. The print must be made to suit the negative. A negative that will give a bad print by one process will yield an excellent print by another process. Many amateurs, other than beginners, thought that when the plate was developed and fixed they had done their work; but it was not so. The photographs are judged by the prints, and it was, therefore, to the printing of the negative that amateurs must devote their attention.

A prize had been offered by Mr. Hodges for the best picture taken at the last Club outing, and it was announced that Mr. Fred. Brocas was the winner.

On Saturday last, forty members and friends sat down at the annual dinner of the Holborn Camera Club, held at Anderton's Hotel. Mr. H. Raphael took the chair. Various toasts followed. A visitor proposed "The Holborn Camera Club," coupling with it the name of Mr. Fred Brocas as the originator of the Club.

Mr. F. J. Cobb, the secretary, in responding, apologised for the absence of the president, who was unable at the last moment to attend. The Club, he said, was in a very prosperous condition.

Songs were given by members and friends during the evening, and various prizes were offered for competition at the annual exhibition next February. The inevitable flash-light photographs finished up a most enjoyable evening.

To-night Mr. T. C. Hepworth will give a lantern demonstration.

---

### North Middlesex Photographic Society.

*November 9th.*—Mr. J. W. Marchant in the chair.

An exhibition of members' lantern slides was given to an audience of about 200 members and friends. The views depicted were of a varied character. Ice-bound rivers and trees covered with the winter's rime alternated with hill, valley, and streamlet basking in the summer sun; cathedral aisles and cloisters with the bustle of sea-side popular resorts; quaint little old-world nooks and corners in provincial cities, followed by the solitude of glens and tarns deep hid in the recesses of Welsh and Scottish mountains. Some 220 slides were thrown upon the screen.

The Fry Manufacturing Co. sent a number of slides made from the late O. G. Rejlander's negatives. These, being figure subjects, were a welcome addition to the evening's entertainment.

The next meeting will be held on November 23rd, when Mr. F. E. Jones will demonstrate the working of hot-bath and sepia platinotype paper. A special feature of the demonstration will be that Mr. Jones will develop prints made from negatives which any of the members choose to send him. Members doing so will thus have an opportunity of knowing whether they are getting the best results from their negatives. Visitors will be welcome.

---

### Lowestoft and District Photographic Society.

The first entertainment of the season was held on Thursday, 5th inst., at the Public Hall, when a selection of photographic slides by Messrs. G. Freeman, F. Estcourt, T. Rose, A. M. Smith, W. Stringfield, F. Everest, and Master Ernest Hume, were thrown on the screen by the Rev. A. Wells, assisted by Mr. G. Tillett.

The chair was taken by the president, Mr. G. F. Mayhew, who introduced the Society to the audience, and said he hoped the time was not far distant when they would possess a home of their own.

The programme included vocal and instrumental music and recitations, and a feature of the exhibition was a large number of American slides received from the "Interchange Society."

### Sydenham Camera Club.

At an exhibition of photographs and lantern slides in the Clarence Hall, Anerley, on the 2nd inst., the walls of the room were lined with an excellent collection of photographs, the different styles of printing lending a pleasing variety to the effect. During the evening there were two exhibitions of lantern slides, which, as well as the pictures, were the work of the members.

The lantern was lent by Mr. Sargeant, of the Croydon Microscopical Society, and was worked by Mr. Chapman. The members exhibiting were, Messrs. Budd (president), H. Gray (hon. secretary), G. Austin, S. Austin, Barlow, Chapman, Cole, Piggott, Pyke, Wiltshire, and Zimmer. Mr. W. Tylar had a helioscopic lantern on view, and the Photo. Artists' Supply Association had a stall also.

---

### Richmond Camera Club.

*November 6th.*—Mr. Ardaseer presided at the lantern, and showed slides by himself and Messrs. Ramsay, Kelsey, Davis, Carolin, and Arthur Hunter, those by the last-named including some highly interesting scenes of Central African travel, from negatives taken by a relative of Mr. Hunter, who had made the Dark Continent his hunting ground.

Several new members have lately been elected.

---

### Tooting Camera Club.

The first meeting of the session was held on the 4th inst., when the President, by the aid of the optical lantern, exhibited a large number of slides made by members and friends. Mr. W. E. Bond was elected a member.

The next meeting will be held on the 27th inst., when lantern slide making by various processes will be the topic.

---

### Rotherham Photographic Society.

*November 3rd.*—Dr. Baldwin (president) in the chair.

The annual members' competition awards were announced as follows:—Class A, six untouched negatives, 1, Mr. H. C. Hemmingway (hon. sec.); 2, Mr. E. I. Hubbard (vice-president). Class B, six negatives and prints resulting from Society's excursions in 1891, 1, Mr. Hubbard. Class C, six albumenised silver prints, 1, Mr. W. Mason. Six gelatino-bromide prints, 1, Mr. Hemmingway. Six prints (any other process), 1, Mr. Hubbard. Class D, six lantern slides, 1, Mr. G. T. M. Rackstraw (vice-president); 2, Mr. Hemmingway. The prizes in classes A and D, amounting altogether to £2 2s., had been given by the president. The judges were Mr. B. J. Taylor, Mr. Geo. Bromley, and Mr. Ernest Beck, respectively the president, vice-president, and secretary of the Sheffield Photographic Society. The competition work was afterwards on view.

The Fry Manufacturing Co. had lent a series of zoological slides, chiefly from negatives by Mr. Gambier Bolton, and they were displayed by means of the oxy-hydrogen lantern operated by Mr. Leadbeater, the treasurer.

---

### Oxford Photographic Society.

On November 3rd, the President (Mr. E. A. Ryman-Hall), gave an interesting exhibition of slides made from hand-camera negatives (films). The slides shown, representing various parts of England, from Westmoreland to Brighton, proved what can be done with a hand-camera in careful and experienced hands.

About 112 members and their friends were present.

---

### Sheffield Photographic Society.

*November 3rd.*—Mr. B. J. Taylor in the chair. Two new members were elected.

Mr. T. G. Hibbert gave a practical demonstration on the subject of lantern slide making by reduction in camera, using artificial light, and without the aid of a condenser. After explanation of the different methods used, the lecturer exposed several plates in the camera, and developed the same, which came up satisfactorily, and were afterwards shown in lantern.

The collection of Charity Prize Medal Lantern Slides, lent by the editor of *Photography*, were passed through the lantern, and fully appreciated.

### Lewes Photographic Society.

*November 10th.*—Mr. J. G. Braden in the chair. Mr. E. Brummit was elected a member.

Mr. C. E. Collins, of East Grinstead, gave an interesting and graphic account of " A Short Tour in Scotland," illustrated with lantern slides. Many of the slides were unique in character, consisting of groups of sea birds which inhabit the islands on the west coast of Scotland, and one slide of a wild heron's nest with young. Views of Inverness, Edinburgh, &c., were also shown.

The Hon. Secretary suggested that an album should be sent to members, a great many of whom resided in the country, to enable their work to be seen and criticised, and it was resolved to refer the subject to the committee at their next meeting.

The President showed a slide which suffered from halation, and another of the same subject in which the evil was entirely avoided by simply backing the plate with black paper coated with glycerine.

---

### Leeds Photographic Society.

On the 5th inst., Mr. W. Clement Williams (hon. sec. of the Halifax Photographic Club) delivered a lecture on " Some Aspects of Marine Photography." Marine photography, he said, was often looked upon as a sort of happy-go-lucky kind of thing. Everything comes to him who waits, and in this kind of work it was necessary to wait. It was absolutely essential that the sea and sky should be taken at the same time. In addition to an art knowledge, a ready decision was wanted, for effects must be caught at once. The best effects were to be obtained during the autumn months, when the clouds were at their best. Sunset pictures were difficult to develop, and, indeed, patience was required to develop any kind of marine study. In addition to marine views proper, harbours, quays, the sands, &c., should be carefully looked over for picturesque studies of fisher-folk, &c. One of the chief difficulties here was to obtain a natural pose, and to get people to understand that the genuine picturesque costumes of the fishermen and fisherwomen were required. Too often they wanted to rush off, wash themselves, and appear in their best clothes, when, needless to say, all their picturesqueness disappeared. Mr. Williams dealt at length with technical matters necessary for this special kind of work.

---

### Midland Camera Club.

*November 6th.*—Mr. Hall Edwards (president) in the chair. Fifteen new members were proposed, which will make the total membership sixty-three.

The Chairman reported progress with regard to the club rooms, and the hon. sec. announced receipt of gifts. The council have decided that on every Monday evening there shall be an informal smoking and conversational evening.

The President then read a paper upon " The Aims and Objects of a Photographic Club," in which he dealt with the social, scientific, educational, artistic, and other duties. Amongst these, he referred to the duties of a club towards the public, and stated that the council had resolved to offer the services of the Club to charity schools, board schools, and the like, in the way of lantern lectures, or in loaning slides ; and that he was in communication with the Kyrle Society of the town with respect to this.

Prof. Allen suggested the borrowing of the Yosemite Valley set of slides, as likely to afford members the opportunity of seeing the wonders of this marvellous region, which, perhaps, none of them might ever have the opportunity of visiting.

The Hon. Sec. then read a short paper upon " The Registration of Lantern Slides," showing examples of his methods.

Prof. Allen has promised a short paper upon " Nitrogen in Photography," and a longer one on February 5th upon " The Philosophy of Restraint in Development."

---

Royal Institution.—The Christmas lectures to juveniles will this year be on " Life in Motion, or the Animal Machine " (experimentally illustrated), and will be delivered by Prof. John G. McKendrick, M.D., F.R.S., the Professor of Physiology in the University of Glasgow.

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column, which have hitherto been addressed to Mr. Spiller (who, unfortunately, is unable at present to continue his efficient assistance), should be sent to the Editor.

All other Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

J. R. W. (Newcastle).—*Negative Imperfectly Fixed.* You do not say whether the plate has been varnished ; if so, first remove the film by soaking in methylated spirit. Then wash with water, and immerse in either plain hypo or weak cyanide of potassium until the patch of yellow bromide has been entirely dissolved. Finally, wash well in running water, and rear up to dry.

T. B.—*Last Days of the Exhibition.* We had your letter, but as you did not come up to town on the 7th inst., we can only now express the hope that you actually saw the exhibition before it was closed.

Northwich.—*Stock of Hardwich's Collodion to be Made into Collodion Emulsion.* We are not altogether sanguine about the success of working up old solutions into new preparations, but here are the figures if you are intent upon making the trial. Your proportions being right for Hardwich's iodised collodion, the pyroxiline will have to be augmented from about 2 to 10 grains per ounce, and zinc bromide together with silver nitrate separately added. Taking Captain Abney's proportions (see " Instruction in Photography," page 146), your 24 fluid ounces would require 640 grains of $ZnBr_2$ and 960 grains of $AgNO_3$, each dissolved in smallest possible quantity of alcohol, and gradually added ; but, as the collodion contains already 96 grains of KI in addition, another 100 grains of $AgNO_3$ will be required. You will not need any bichromate, but a few drops of nitric acid are recommended to be added, to meet the tendency to fogging. India-rubber pneumatic holders can be obtained of any local dealer.

L. P.—" *The Fifth of November.*" Yes, certainly, Mr. James Clark's picture in this week's *Queen* would have preached a wiser lesson if the little cannon had been turned the other way, so as not to deliver its fire in amongst the bystanders.

M. P. (Brighton).—1. *Paramidophenol.* It is immaterial whether you employ the base itself or the hydrochloride with addition of alkaline carbonate, as stated in the formula. Enquire of Messrs. Hopkin and Williams, 16, Cross Street, Hatton Garden. 2. *Albumenised Paper.* The strong, pungent odour is due to acetic acid, which is often used to break up the mucilaginous character of the albumen, and produce acid conditions at the time of sensitising, by which expedient not only is the preservation of the paper greatly favoured, but the tendency to blistering is supposed to be diminished. It is a good plan to fume the paper with ·880 ammonia immediately before use in the printing frame.

Collotype.—*Chromo-Typography.* Your account is quite correct. It is, as you say, necessary in each plate to stop out all the remaining tints except those which are wanted to deliver the self-colour, or produce combinations by overlay. See M. Leon Vidal's paper in the News of May 29th, June 5th, and 12th—particularly page 419.

W. K.—*Choice of Lens.* It is manifestly impossible to answer in this column, so we are writing to you by post.

D. S.—*Flash-Lamp.* Why resort to magnesium light for illuminating the interior of a church ? It would cost you a deal of labour and expense to accomplish that which could be done so much more satisfactorily by daylight. However, for illuminating caverns and comparatively large open spaces, the apparatus mentioned is certainly the best yet introduced.

Finale.—With this column, J. Spiller takes leave of his numerous correspondents, whom he has for three years tried to serve faithfully and well. The pressure of other engagements compels him, with much regret, to take this step ; but Mr. Editor will doubtless provide an efficient substitute, so that the interests of the News may not suffer in consequence.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1733.—*November* 20, 1891.

CONTENTS.



## GEOLOGICAL PHOTOGRAPHS.

The committee which was appointed some months back by the British Association to collect, arrange, and register photographs of geological interest have, as recent reports have shown, made a fair start in the work which they undertook to do. But they complain that the photographic societies have, in many cases, shown a decided want of interest in the work, and have failed to co-operate with them. It would seem, too, that the committee have not yet secured the attention of as many amateur workers in photography as they had reason to expect, and so it comes about that only about one-half of the British counties are represented in the pictures which have been sent in to the committee. We are sorry that the invitation to send in photographs of geological interest has been so sparsely responded to. It too often happens, in such a case as the present, that the bulk of those who could do much if they cared to take the trouble stand aside, while the real hard work is left to be grappled with by a few enthusiasts. Can it be said that the average amateur is too busy in hunting after medals and prizes of other kinds to care to undertake any work that does not promise him an immediate return? We should be loth to answer the question in the affirmative, but, at the same time, we know that the amateur will not be idle when the opening of an exhibition of photographs is in contemplation.

But perhaps, after all, the real reason why the geological committee do not receive as much support as they might expect may be traced to a certain shyness which people have in dealing with a word which ends in "ology." Some, we feel certain, will turn their backs upon a thing "of geological interest" as upon something to be shunned; not, of course, because there is anything wicked or harmful about it, but simply because they will not be bored with it. They have settled in their own minds that it must be unutterably dull, and they will have nothing to do with it. Some friend, perhaps, has had the misfortune to study a "dry-as-dust" volume on geology, and has described the work as "an awful grind." To him it has been a grind indeed, and he and the writer of the dry volume, for a time, do infinite harm by disseminating a false estimate of a fascinating branch of science. There ought really to be some institution, akin to a lunatic asylum, where dry-as-dust writers and lecturers on scientific subjects should be shut up and punished for their misdeeds, for they have done, and are doing, an incalculable amount of harm in driving the young away from studies which might be made so alluring to them, and which are calculated to be of so much use to them in their future lives.

Writers on photography in our own pages, as well as in other periodicals, have constantly urged upon the large army of amateurs—an army which is always growing—that they should have some aim in their work. It is a pitiable thing to see a man with a camera who is content to take bad portraits of his friends, and "bits," as he calls them, of the surrounding landscape. He must, of course, begin with these mild efforts at picture-making, but he need not continue them, as so many do, to his life's end. He should link his camera work with some other study; and here, in this invitation to contribute to geological knowledge, he has an opportunity of doing far more good than he will ever get from medal hunting. If, too, he makes up his mind to shun at once his old practices, and take up useful work, he may be able, at some future time, to number himself among that select company of workers who will be distinguished as never having won a medal.

But no one knows the charm of working with a settled purpose, and with the attainment of a certain result in prospect, but he who has tried it. He feels all the time that he is conquering difficulties and is getting forward. More than all, he knows that he is adding to his stock of knowledge, and to all but the very ignorant—who know enough already—this itself is a pleasurable thought.

A study of geology, if taken up aright, is by no means the hard nut to crack which some would have us believe. Let the photographic worker who wishes to share in the work, and who knows as yet nothing about it, take up physiography first—Huxley's little book on this subject is so well written that the reader is insensibly led on to peruse it from beginning to end. Then let him take up Geikie's "Geology," and he will find himself making acquaintance with another writer who is never dull. As he reads these and other books, he should make marginal notes with reference to possible illustrations by means of photography. The latter writer's "Field Geology" will also be of use to him later on in showing him how to describe and localise his pictures. With a little reading of this kind the photographer will soon take an interest in his work, and will hunt about for likely subjects with as much ardour as that with which a sportsman pursues his game. Nor need he think that because he has begun the study of rocks, and the searching for "sermons in stones and books in the running brooks," that he need sacrifice his love for the picturesque in nature; for geology and picturesqueness go hand in hand. Does Matlock High Tor become less sublime in its rugged outline because we describe it as carboniferous limestone? Is Dove Dale less beautiful because it is a fine example of the effects of erosion in the same rock? Do the cliffs round about Dover lose their grandeur because we can see in them chalk of different ages? and the dark rocks that fringe Mona's isle sacrifice their weirdness because we can trace them to distant volcanic action? Assuredly not. The photographer who takes up geology as a bye study—even if he only dips into it in a superficial manner—will find himself rewarded by the pleasure which it gives him. Let him, during the coming winter, read it up only a little, and when a more favourable season comes round, he may be able to show in a graphic—or, should we not say, photographic—manner that he has not read in vain.

## FRENCH CORRESPONDENCE.

BY LEON VIDAL.

Photographic Society of France—Photographic Conferences—Other Photographic Meetings—Graphic Representation of the Progress of Photography—Brussels Congress—Colour-Sensitive Plates in France.

After two months' holiday the members of the Photographic Society of France are again holding their periodical meetings. At the reunion of the Society on the 6th inst., which was presided over by M. Janssen, nothing of very great importance came before the meeting. M. Balagny explained in detail the method by which he obtains, by reduction, lantern slides from larger sized negatives; and the results he showed, which were projected by a lantern before the members of the Society, left nothing to be desired. The pictures shown constituted an interesting *souvenir* of the recent Congress at Brussels, for they were the offspring of negatives made during the excursions inaugurated by that body.

M. Piver explained a method of working a camera on board ship. A twin camera is suspended by cords from any convenient part of the rigging, so that the operator has both hands at liberty while taking the picture. But it is difficult to give any idea of the instrument by simple description; it must be seen to be appreciated. Albeit, we have a notion that it is somewhat more complicated than is either necessary or desirable. The double body—one half being used as a finder—makes the apparatus somewhat cumbrous.

M. Gillors has produced a camera in aluminium of very light weight, not including the lens. This extreme lightness, combined with solidity, cannot fail to be very serviceable. Small apparatus generally has greatly gained by the employment of this metal.

The President announced that the advertised conferences on photography which had been authorised by the Minister of Fine Arts, and were to have taken place on Sunday at the National Conservatoire of Arts and Manufactures, is postponed till the 22nd of November. Each branch of photography will be treated by a person capable of dealing with it; among the number may be mentioned MM. Laussedat (director of the Conservatoire), Davanne, Leon Vidal, Balagny, Moëssard-Londe, Gravier, &c. The complete programmes of these conferences, and the subjects of which they treat, will presently be published. Here, then, is the preliminary step to the creation of a true photographic academy. These conferences will show the interest with which this question is regarded, and may possibly form the nucleus upon which a true practical and theoretical school of photography may be established. There are already the National School of Decorative Arts, that of M. Gravier at the Philotechnic Institution, and that of M. Cousins at the Tours San Jaques. These certainly useful courses cannot, however, be considered as forming a complete teaching academy, such, for example, as that which exists at the Imperial Institute of Photography, Vienna, under the direction of Dr. Eder.

MM. Marilier and Robelet, patent agents, have conceived the idea of publishing a diagrammatic account of the progress of photography, based on the number of photographic patents taken out since 1839. Two distinct curves have been traced; one for apparatus, and the other for the chemical side of photographic work. This last curve does not attain any great height, whilst that of the apparatus, especially in recent years, shows decided advance. For this purpose it was necessary that the authors should attend the Brussels Congress, only having, so to speak, the Parisian records at their command.

We must regret that the foreign delegates who put in an appearance at the Brussels Congress were so few in number. A really true international pronouncement on the various matters before the Congress and on the decisions arrived at was, therefore, an impossibility. The work of such a Congress cannot take the highest rank unless each nation sends officially a delegate to represent it. These gentlemen should be instructed to make themselves acquainted with the business to be brought before the Congress, and should watch the interests of the various industries of the country which they represent. As it is, the work is purely amateur and optional, and although it must not necessarily be condemned for that, it would be much better if it were supported and strengthened by official recognition.

We regret that more attention was not devoted at the Congress to the important subject of orthochromatic processes. These processes do not receive the attention in France that they deserve. But we will not enter more fully into the subject here, more especially as we deal with it in detail in the forthcoming YEAR-BOOK OF PHOTOGRAPHY.

## LITERARY LECTURES AND THE LANTERN.

BY PROF. W. HALL GRIFFIN, B.A.

THE lantern is now freely used for scientific lectures, and for those of a descriptive character. I am confident that it can be as usefully employed for literary purposes, and hope soon to see it abundantly so used.

My own ideas as to the employment of the lantern have simply grown out of my experience of the need of appeals to the eye to supplement those to the ear. I have found this as a public schoolmaster and as a lecturer. I have for years employed stencilled charts for history and literature, and have supplemented these by the use of photographs, portraits, &c., &c.

### SLIDES FOR LITERARY LECTURES.

My slides for literary lectures I would class under three heads:—

1. Those which illustrate the *lives* of writers. Such views are always of interest, and, although not *directly* helpful to the understanding of literary works, they serve to give reality to facts mentioned, and to bring home the surroundings of a writer in such a way as to arouse interest in the works themselves.

Among such views I class portraits—so many of which Messrs. Mansell, of Oxford Street, now supply in their "Literary Series"—views of the homes and haunts of our writers, autographs, &c. These awaken great interest when they serve as illustrations in our books—as they so freely do now—and I have found them as useful in lecturing.

### HOW TO ILLUSTRATE BOOKS.

My own idea of their use educationally is to bring out as fully as possible the circumstances under which works were produced—to deal with the home of the writer, we will say, and then take the works produced there. This is often most useful.

2. Views illustrating the *works* of writers. Any such views have a distinctly *educational* value, besides being of interest. Very often the views already spoken of are of this character; for the surroundings of a writer being known, one often sees the source of the illustrations he uses or the descriptions he gives. Scott and Wordsworth are instances of the possibilities in this direction. But what is true of these two is true, in a degree, of all writers. No one who has not studied the question had any idea of the amount of useful, helpful illustrations that may be given. Some wonder has been excited by my attempting to illustrate Browning. May I give an instance of the possibility? Take the well-known poem, "Andrea del Sarto."

### ILLUSTRATING BROWNING.

(1) A picture hanging in the Pitti Palace, at Florence, shows the painter in conversation with his wife. The sadness of the expression on the painter's face excited, it is said, Browning's interest, and suggested the monologue put into his mouth by the poet. I use a slide to show this picture.

(2) The famous portrait of Andrea in our own National Gallery is said to have influenced the treatment of the poem. This, therefore, is shown. It all serves to connect the unknown foreign picture with what should be known to all here.

(3) A view of Andrea's masterpiece in Florence, and of his Madonna in our own gallery, as well as a portrait of his wife (in Madrid), serve to bring out the fact (referred to in the poem) that the wife was his model for the Virgin, as well as to exhibit the work of the "Faultless Painter."

(4) A view of the house in which Andrea lived in Florence—the house Browning had in his mind in writing the poem, and where he imagines the conversation to take place—also serves to quicken interest, and to make the poem more real.

(5) A few views of the surroundings of that house—the church, and its garden nearly opposite, the view up the road to the hills of Fiesole—all of them in the poet's mind as he wrote, and all referred to—are other illustrations.

Now, I have chosen this, a somewhat favourable instance, because I have found that many students of the poem had *no idea whatever* that reference was so often made to real places, events, and people, and they have shown the greatest interest in the views. I use it to enforce the remark that only a close study of works can enable any one to realise how much aid the lantern can give in developing the depth of meaning, or in giving reality to such works.

### AND THE USE OF THE LANTERN.

Such views would illustrate passages which would be read while the views were on the screen.

3. Many works—let me keep to poems—are incapable of such illustration. As the *Daily Telegraph* remarked in its leader on the subject: "The ode 'To a Skylark' would not be rendered any more delicious than it is by a magic lantern slide depicting the bird in the act of soaring heavenward." Quite true. But my third class of slides consists of passages from poems—printed passages—thrown on the screen, so that what is read or criticised may be before the eyes of all. The audience at once become audience and spectators—or, as Bunyan might say, "Eye-gate and ear-gate are attacked at once."

The use of such slides accompanied by the other two kinds is obviously advantageous. I also have charts of the lives of writers, and in some cases an analysis of a work, &c., as slides. By the use of those slides, passages can be *compared* far more efficiently than by mere appeals to the ear. It also allows of a passage—when needful—being kept before the eyes of all, so as to enable a more detailed criticism to be entered into—a criticism of any of those smaller points which are apt to be more wearisome when the passage is not before the eye.

### THROW POEMS ON THE SCREEN.

Also, such slides enable poems to be dealt with—the "Skylark," for instance—which cannot be illustrated. The beauties or defects of a poem can be far more efficiently pointed out when the *reading* of passages and the comments are accompanied by the appeal to the eye. It also serves the practical purpose of keeping up the continuity in the use of the screen, which seems to me needful in the lantern lecture—in most cases, at least.

The labour involved in arranging such a mass of illustration is, of course, very great; but I hope to see a great development in this direction, one of the best means, I am confident, of arousing interest in the study of the lives and works of our great writers, poets, and thinkers.—*Help.*

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.—On November 11th Mr. Tucker, Loughborough, gave a lecture entitled "A Journey through Snowdonia," illustrated by a series of well-executed slides, the hon. secretary presiding at the lantern.

"GREAT THOUGHTS."—With the Christmas number, to be published on November 30th, will be given a plate, printed in fifteen colours, from a painting by the German artist Heinrich Hofmann, entitled "The Great Teacher," depicting Christ disputing with the doctors in the temple. The picture from which this plate is copied is now hanging in the Dresden National Gallery.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Transferring Collodio-Chloride Prints to Glass—Explosive Magnesium Powders—Lantern Slides with the Pyrocatechin Developer—Husnik's New Transfer Paper.

*Transferring Collodio-Chloride Prints to Glass.*—The commercial collodion stripping paper—*i.e.*, paper coated with collodio-chloride emulsion—the film of which may be stripped off its paper support, allows of the transfer of the collodion print to other surfaces; for instance, to artificial ivory—as I have described in my previous letter—or to glass, &c. With regard to the latter, Bruno Risse, who for many years has made a speciality of printing with collodion emulsion paper, recommends the following method, in order to produce prints with a high and fine gloss, known as "Disdéri pictures." A few drops of a solution of 1 part of white wax in 100 parts of ether are poured on a plate glass previously carefully polished with ammonia, and, by means of a pad of cotton-wool, distributed uniformly to all directions, always starting from the centre. The print to be transferred, after being thoroughly washed, is placed with the film side down on the glass plate, and pressed tightly against it by means of a squeegee, a piece of strong paper being previously placed on the copy in order to take care of it. After the print on the glass has become half-dry, it is coated with a diluted solution of gum-arabic, excepting a small border round the edges, which is left free. An enamelled cardboard, a little smaller than the print, is then tightly squeezed on it, and the whole allowed to dry completely. The print will then easily come off the glass plate by passing carefully a knife beneath it at one corner. It should now be trimmed, and, after the edges have been slightly coated with starch paste, transferred to the card, with the firm printed on it. A small sheet of glass, slightly coated with wax solution, is then laid on it, and the whole placed into a bookbinder's or a screw-press, with only slight pressure. If it is desired to obtain prints with a fine matt surface, the only modification of the above-described method consists in substituting a ground glass for the plate glass. The prints may also be very easily transferred to ordinary glass, to be used as diapositives and transparencies; it is then only necessary, in this case, to print the image very deeply. The white of one egg is put in a cup, and after being beaten to a froth by aid of a fork, it is allowed to settle for a day, and then diluted with a little water. With this albumen solution the plates to be employed are coated, and the prints are squeezed on them and allowed to dry. If they are immersed in a dish containing very hot water, the paper support comes off very soon, and the transfer is finished.

*Explosive Magnesium Powders, and the Rapidity of their Combustion.*—New experiments have been made by Prof. Eder and E. Valenta, of Vienna, with regard to the important question as to the quickest and most intense flash-light. It results from them that the explosive magnesium mixtures are to be preferred to the pure magnesium powder in all cases where an intense and very short illumination is required. The rate of combustion and the intensity of the flash depend upon the nature of the oxygen developing substance which is used in the explosive mixture. The following details are worthy of mention. Mixtures of 1 part of magnesium with 3 parts of permanganate of potash burn violently in the manner of an explosion, without the whole of the light which the magnesium is able to produce being utilised; if only from $\frac{3}{4}$ to 1 part of the permanganate is added, the combustion will be slower and the intensity greater. The bichromates of ammonium and of potassium produce mixtures which burn with a hissing noise and comparatively slowly, the intensity of the light being somewhat lower. A mixture of equal parts of saltpetre with magnesium burns quietly, the intensity of the flash being very considerable, and the rate of combustion about equal to that of the mixtures with chlorate or perchlorate of potassium. In cases where the ready prepared mixture is to be forwarded by post, the saltpetre and the permanganate of potash respectively are, therefore, to be preferred to the chlorates, for the reason that either of the former may be forwarded and employed without fear. The following table contains the results of the experiments in question:—

| Mixture of 1 gr. of magnesium with | Time of combustion. | Relative quantity of light, determined by means of the sensitometer. |
|---|---|---|
| $\frac{3}{4}$ gr. of potassium chlorate and $\frac{3}{4}$ gr. of potassium perchlorate ... ... | $\frac{1}{11}$ second | 48 |
| 3 gr. of permanganate of potash ... ... ... | $\frac{1}{14}$ ,, | 16 |
| 1 gr. of permanganate of potash ... ... ... | $\frac{1}{7}$ ,, | 48 |
| 1 gr. of ammonium bichromate ... ... ... | $\frac{3}{4}$ ,, | 40 |
| 1 gr. of potassium bichromate ... ... ... | $\frac{1}{4}$ ,, | 36 |
| 1 gr. of saltpetre... ... | $\frac{1}{6}$ ,, | 48 |

*The Production of Lantern Slides by the Pyrocatechin Developer.*—Prof. Eder and E. Valenta are highly recommending the pyrocatechin developer for the production of lantern slides on commercial gelatino-bromide plates, the latter obtaining by it an agreeable brownish-grey colour, which is much more suitable for the purpose than the greyish-black tone imparted to them by other developers. The following formula is given:—

1. One part of carbonate of potash is dissolved in ten parts of distilled water.
2. One part of pyrocatechin is dissolved in fifty parts of distilled water.

In the case of *very soft* transparencies being desirable, a mixture should be prepared of—

| | |
|---|---|
| Water ... ... ... ... ... | 60 c.c. |
| Solution 1 (potash)... ... ... ... | 20 ,, |
| Solution 2 (pyrocatechin) ... ... ... | 3 ,, |

If this solution is to be used, the exposure should be prolonged to some extent, and the development proceeds a little slower than with pyrogallic acid development. After the plates have been developed, they are rinsed with water, and fixed in ordinary hypo solution (without the addition of acid sulphite). If more vigorous transparencies full of contrast are desired, only about one-half the exposure as in the previous case should be given, and the following solution employed:—

| | |
|---|---|
| Water ... ... ... ... ... | 60 c.c. |
| Solution 1 (potash)... ... ... ... | 20 ,, |
| Solution 2 (pyrocatechin) ... ... ... | 10 ,, |

A few drops of potassium bromide solution (1 : 10) may also be added if required; it acts as a very strong restrainer, so that the exposure should, in this case, be considerably prolonged. The above given developer becomes brown soon after being mixed; several plates may, however, be developed in the same solution if it is done quickly. The old or already-used solution acts slower and more plucky, and, by the aid of it, the brilliancy of the transparencies may be considerably increased, especially if the second formula, which contains a larger quantity of pyrocatechin, is employed.

*Husnik's New Photo-Lithographic Transfer Paper.*—This transfer paper, which was mentioned in a previous letter on the occasion of the description of a new photo-lithographic process, is, as I am informed, obtainable in England. It possesses a comparatively weak but hardened gelatine film, which, if placed in water, swells only a little, producing, therefore, a comparatively flat relief, every single point of which is accessible without difficulty, so that the colour may be easily removed from it during development with the sponges; the character of the negative image being therefore truly reproduced by it. The prints obtained on this paper may be developed with ease by moderate friction, and the resulting pictures are extremely sharp and pure. The sensitising of the paper is done by placing it in a solution of chrome salts for about two minutes; it is then laid upon a plate glass, prepared with a thin layer of wax, and allowed to dry thereon overnight. A very fine glossy surface is obtained by this method.

## PRINTING WITH SALTS OF CHROMIUM.

BY C. GRAVIER.

PLUNGE a sheet of white paper into a four per cent. solution of bichromate of potash or ammonia, and dry it in the dark, either hung up or between sheets of bibulous paper. Expose the paper under a negative, as usual, but shortening by at least one-half the time of exposure required for papers prepared with the silver salts. As soon as the details of the negative are well defined, plunge the print into water, and allow it to remain until it is entirely freed from the yellow tone which forms the background of the design. This operation requires at least thirty minutes; provided, however, that care has been taken to renew the water during this space of time, it may be performed in weak diffused light. Now place the image in a filtered bath of protosulphate of iron (5 parts to 100 parts of water). After an immersion of two or three minutes, remove the print from the bath and put it into clear water, frequently renewed, and allow it to remain in this water for at least thirty minutes, and then treat the paper with a solution of gallic acid, which, without objection, may be more or less concentrated. In a few moments the image is fully developed; it presents a beautiful violet-black tone, which is most artistic and desirable. The print is washed for a few moments in clear water, and allowed to dry. The image is but slightly affected by the air, and is formed by a sort of ink deposited on the surface and in the body itself of the paper. The paper, after having been treated with the sulphate of iron solution, may be plunged into a solution of ferrocyanide of potash instead of gallic acid; an image of a Prussian-blue tone is thus obtained, which, treated by the acid, becomes greenish in colour. Diluted alkaline solutions give a darker blue tone, bordering on violet. Finally, the same paper passed in a sulphate of iron bath, when afterward treated with substances producing a coloured compound insoluble with sesquioxide of iron, will also produce coloured images.—*L'Amateur Photographe.*

## GEOLOGICAL PHOTOGRAPHS COMMITTEE—BRITISH ASSOCIATION.

THE following is a list of the members of the Committee:—Professor James Geikie, LL.D., F.R.S. (*Chairman*); Dr. Tempest Anderson, B.Sc., F.G.S.; Professor Valentine Ball, LL.D., F.R.S.; James E. Bedford, F.G.S.; Professor T. G. Bonney, D.Sc., LL.D., F.R.S.; Professor W. Boyd Dawkins, M.A., F.R.S.; James W. Davis, F.G.S.; E. J. Garwood, F.G.S.; William Gray, M.R.I.A.; Robert Kidston, F.R.S.E.; Arthur S. Reid, M.A., F.G.S.; R. H. Tiddeman, M.A., F.G.S.; W. W. Watts, M.A., F.G.S.; Horace E. Woodward, F.G.S.; Osmund W. Jeffs (*Secretary*), 12, Queen's Road, Rock Ferry, Cheshire.

This Committee was appointed by the British Association for the Advancement of Science in 1889, for the purpose of arranging for the "Collection, Preservation, and Systematic Registration of Photographs of Geological Interest in the United Kingdom." Since its formation, the Committee has been successful in obtaining a number of photographs, of which 588 were received and registered up to the month of August, when their second report was presented at the Cardiff meeting of the British Association; the total being made up as shown in the following summary, viz.:—Berkshire 3, Cheshire 28, Cornwall 18, Cumberland 2, Derbyshire 21, Devonshire 21, Dorsetshire 12, Hampshire 2, Hertfordshire 4, Isle of Man 22, Kent 17, Lancashire 30, Leicestershire 2, Montgomeryshire 3, Northumberland 9, Shropshire 14, Somerset 12, Staffordshire 3, Wiltshire 5, Worcestershire 2, Yorkshire 164, North Wales 57, Scotland 45, Ireland 92; total, 588.

It will be seen from the foregoing that about half of the British counties are not as yet represented in the collection, while the amount of the contributions from several of those counties named in the list show that considerable work is yet required to be done towards the completion of the scheme the Committee have in view. Nearly all the photographs already received are of considerable educational utility, while many are also valuable as permanent records of important geological phenomena.

The Committee greatly appreciate the help that has been afforded from so many quarters, and would respectfully urge upon geologists the desirability of further assisting the scheme, with the object of completing a national collection of photographs illustrating the geology of our own country.

The secretary of the Committee will be glad to receive (at the address above) copies of suitable photographs, which will be duly numbered and registered; or to be favoured with:—

1. Lists and details and photographs of geological character already in existence.
2. Names of local societies, or persons, who may be willing to further the objects of the Committee in their own district; or
3. Particulars of localities, sections, boulders, or other features which it may be desirable to have photographed.

A list of such *desiderata* will be published when sufficient material has been obtained.

The attention of local societies and field clubs is specially directed to the excellent results attained in those districts where systematic surveys have been organised for the furtherance of the work (*vide* report). It is felt that this method could be usefully followed in many of our counties where the machinery exists in the shape of an influential society of geologists or photographers, or a naturalists' union. It is suggested that local societies could materially aid the scheme by mapping out their districts under the direction of a local geologist, and drawing up a list of sections and localities of which photographs would be desirable. New sections aud exposures of strata should be noted. This preliminary work could be doue duriug the winter sessiou, and arrangements made for the use of the camera in the ensuing spring, or when opportunity offered.

In order to secure uuiformity of action, and as a guide to those who are willing to assist in the scheme, the annexed circular of instructions has been drawn up, copies of which will be supplied on application to any officers of societies, or other persons who may desire to have them, together with copies of the form on which the needful particulars of the photographs may be given.

Detailed lists of photographs officially received are published iu the report of the Committee, which also states where the photographs may be obtained. Lists for insertion in the third report of the Committee will be received up to June 15th, 1892.

### Instructions for the Collection of Geological Photographs.

Photographs are desired illustrative of characteristic rock exposures, especially those of a typical character or temporary nature; important boulders; localities affected by denudation, or where marked physiographical changes are in operation; raised beaches, old sea-cliffs, and other conspicuous instances of marine erosion; characteristic river-valleys or escarpments, and the like; glacial phenomena, such as *roches moutonnées*, moraiues, drums and kames, or any natural views of geological iuterest. Photographs of microscopical sections and typical hand-specimens of rocks are also admissible.

1. The views should be taken under skilled geological direction, and in every case the most typical views should be secured in preference to general views. Societies are urged to form small committees for the purpose of noting sections suitable to be photographed, and arranging such work as may be possible in each district. To this end it is anticipated that the services of many amateur photographers may be usefully brought into requisition.

2. Size of photograph recommended, 8½ by 6½ inches ("whole-plate"); but this is *optional*. In view of the difficulty of carrying a heavy camera and plates, it is not desired to exclude smaller views when these are well defined and clear. In the case of small negatives, when sharp, an enlargement to whole-plate size is desirable for the purpose of a place in the collection. The views should be printed by a permanent process whenever practicable. Isochromatic plates are strongly recommended to be used.

3. In order to preserve its scientific value, each photograph should be accompanied by as many of the following details as can be conveniently given. Forms for this purpose will be supplied on application. (*a*) Name and position of section or locality; (*b*) special features shown, with illustrative diagrams, when necessary (further details may be given, if more convenient, on a separate tracing attached to the photograph); (*c*) height and length of section, and compass direction; (*d*) name and address of photographer, or of the society under whose direction the view is taken; (*e*) date when photographed; (*f*) indication of direction of light and shade—*i.e.*, state whether taken in "direct light" or in "shade."

4. Each photograph sent in for registration should bear a *local* number, and the accompanying form should be numbered in accordance therewith.

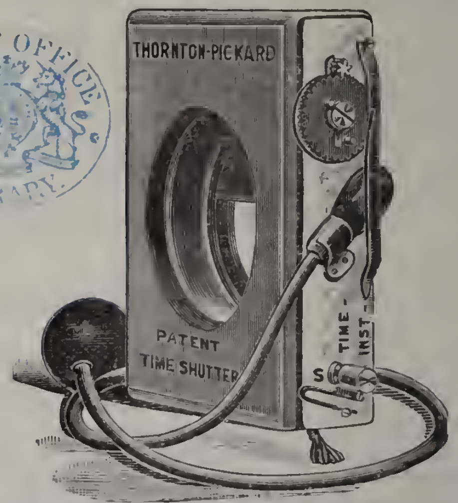
5. Photographs should be sent *unmounted*. Mounts of uniform size, with perforated edges for binding, to hold one whole-plate, two half-plate, or four quarter-plate views, are being prepared, and the required number will be forwarded, on application, to donors of photographs who prefer to mount their own prints.

6. Lists of photographs, copies of photographic prints, and information relative thereto, should be sent under cover to the Secretary to the Committee *at the earliest possible date*, in order to facilitate the work of registration.

Further information may be obtained from the members of the Committee, or from the Secretary, Mr. Osmuud W. Jeffs, 12, Queen's Road, Rock Ferry, Cheshire, to whom communications may be addressed.

## THE THORNTON-PICKARD SHUTTER.

This favourite form of instantaneous and time shutter has lately been much improved by the makers. In the old form of this apparatus, the lever for setting the shutter at either "time" or "instantaneous" had to be manipulated after every exposure. This is no longer the case; once set, it will do for any number of exposures until altered by




the operator. We also note that a speed indicator has been added, a glance at the dial of which will show at what speed the instrument is working. There are several minor improvements which add greatly to the efficiency of the shutter. At all speeds it works with extreme steadiness, and there is no chance of vibration being communicated to the camera to which it is attached.

Hackney Photographic Society.—A meeting was held on Thursday last, when Mr. Howson gave a demonstration on gelatino-chloride paper, and spoke of the permanency of the print, quoting Mr. Chapman Jones as an authority.

Gold in solution is said to be contained in sea water, and a number of chemists have interested themselves in analysing the water of the sea for the purpose of settling this much-ventilated question. The results of their investigation have proved beyond a doubt that sea water contains both gold and silver. A number of chlorides, sulphates, bromides, and iodides found in the water of the sea have, to a limited extent, the power of dissolving the two precious metals. A distinguished German chemist some years ago determined, by actual experiment, that a ton of sea water contains one grain of gold held in solution by the iodide of calcium. The quantity of silver is much larger. Sheets of copper taken from the hulls of ships which have sailed through the tropical seas are often so rich in silver as to be worth smelting. One of those statisticians who are fond of dealing with immensity, calculates that the sea holds in solution over 2,000,000 tons of silver, or about £15,489,600,000, a sum about ten times as great as the entire computed silver product of the world from the earliest times to the present day. No available process has been invented to extract the precious metal from the water, however; so, for all practical purposes, it is lost to the world's use.—*Science Siftings.*

## A PLEA FOR AN OLD PRINTING METHOD.

It seems to be an established fact that the demand for photographs has for some years been diminishing, and it is not now nearly as great as it was, say, ten or fifteen years ago; and the question, "Why do people now not buy so many photographs as in former years?" has been discussed at considerable length in some of our British contemporaries. Various causes have been assigned to the admitted falling off in the demand, among them the fact that among the thousands of amateurs that have been brought into existence by the advent of the gelatine plate, many who were, or would have been, buyers are satisfied with their own productions, as, although less perfect than those of the more experienced professional, the added interest of self-creation more than makes up for the deficiency.

This is plausible, but will only to a limited extent account for the decrease of the demand. A much more important factor is the fact that people are tired of the at one time omnipresent album, with its uninteresting array of expressionless figures, of whom those who were expected to examine and admire knew nothing, and about whom they cared as little. Tired also of the larger pictures mounted on heavy cardboard, and accumulating beyond all convenient methods of handling and storing; and possibly tired also of the "pretty" silver prints, with their minute detail, glossy surface, and limited range of colour. One of the wise men of the East hit the nail on the head when he suggested the printing of pictures on sheets of thick paper large enough to leave a wide, clean margin, so that, like water-colour or other drawings, they might be stored in portfolios and examined in comfort.

It was further suggested that the print should be made in platinum or carbon, or some of the more modern processes; but some of these are expensive and others troublesome, and, for the amateur whose means and time are limited, and who delights to give pleasure to his friends by presenting them with choice specimens of his work, something easier and less costly must be resorted to.

In looking over a collection of prints made in 1855, we think we have hit on the right thing. They are 8 by 6 prints on 12 by 10½ inch sheets of paper, giving a clean margin of two inches on top and two sides, and two and a-half inches at bottom. They seem as fresh and bright as when printed, although the paper is toned down a little, and might readily be mistaken for photogravures just from the press. A reference to our notebook shows that they were made on Turner's heavy, smooth drawing paper, salted by immersion, some in common sea water, and some in a 5, 7, and 10-grain solution of common salt, and sensitised by floating on a solution of silver nitrate and citric acid. Some of them were toned in the old "fixing and toning bath," and some simply fixed in a fresh solution of sodium hyposulphite, the latter being, if possible, finer than the former, a warm purple brown.

During the past week, we have made a series of experiments on those lines, and are very much pleased with the results, the pictures being, according to our taste, much superior to ordinary silver prints from the same negatives. The only difficulty in connection with the method is that of getting a suitable paper. We were anxious to utilise something made in this country, and so save the absurd tariff exactions that so hamper and restrict American art, and therefore tried a number of samples obtained from one of the wholesale houses of the city. Several of those answered the purpose admirably, except for minute spots, evidently caused by the presence of metallic particles. The best—and it was almost free from those blemises—was a heavy sample watermarked "Ledger Mills," and it leaves very little to be desired. The outcome of those experiments is included in the following instructions, which, if carefully followed, will result in the production of prints that will be thoroughly appreciated by people of artistic taste.

Cut the paper into the required sizes, with a wheel trimmer, or knife and straight edge, so as to prevent ragged edges—7 by 5 negatives should be printed on sheets at least 11½ by 9—as the less handling, even after only salting, the better; and any convenient quantity may be salted at once, as, if kept dry, it will keep indefinitely. Immerse it, sheet by sheet, in a 5-grain solution of common salt; slightly different shades are produced by varying the strength up to ten grains to the ounce, but we prefer that resulting from the weaker bath, taking care that no air-bubbles are formed. After all are immersed, turn the lot upside down, and take them up one by one, and hang up to dry. They dry flat, and will remain so if kept between the leaves of a book or under pressure. Make a sensitising bath as follows:—

| | |
|---|---|
| Silver nitrate ... ... ... ... | 1,200 grains |
| Citric acid ... ... ... ... | 300 ,, |
| Distilled water ... ... ... | 20 ounces |

A precipitate of silver citrate may probably be formed, but will dissolve on the application of heat—place the bottle in warm water, or on the top of a warm stove—and remain in solution. Make pencil marks on one side of each sheet, and float them in the ordinary way, marked sides up, for two or three minutes, examining carefully for air-bubbles, which seem to come more freely on plain than on albumenised paper, and dry and keep under pressure. We have not had an opportunity of testing the keeping qualities of this paper, but the probability is that it will keep as long as the ordinary "ready sensitised" article of commerce.

To prepare the negative for printing, cut "needle-paper"—or anything thin and opaque—into strips a little broader than the intended margins, and paste them along the edges of the negative on the film side, covering all that is to be left out. The printing should be done in diffused light; but that can easily be accomplished, as the paper is considerably more sensitive than ordinary albumenised paper. Print deeply, and, without washing, place in a 1 to 8 solution of sodium hyposulphite for ten or fifteen minutes, wash thoroughly, and hang up to dry. The colour will be a warm purple brown, very pleasing, and suitable for most subjects. If a deeper purple, or even a darker colour, is desired, add one grain of gold to the eight ounces of hypo solution, and, if the proper shade is not reached before ten minutes, leave it till toned as desired; but if the desired shade is reached in less than that time, the print should be removed and placed in a simple solution of hypo for the remaining time necessary to make up the full ten minutes.—*The Beacon.*

Endurance of a Daguerreotype.—A remarkable example of the enduring qualities of the Daguerreotype is to be found in the old graveyard at Waterford, Conn. In the headstone that marks the grave of a woman who died more than forty years ago her portrait is inlaid, covered with a movable metal shield. The picture is almost as perfect as when it was taken.—*Detroit Free Press.*

## Notes.

A representative committee has been formed in connection with the proposed testimonial to Dr. Maddox, to whom is due, more than to any other one worker, the gelatine process which has revolutionised photography. The subscription list is headed by a handsome donation from one of our principal manufacturers of dry plates, and others will no doubt follow suit. But, beyond the manufacturers, the users of dry plates should not neglect this opportunity of testifying to their indebtedness to the labours of this pioneer worker. The modern amateur owes his photographic existence to the gelatine dry plate, for there is not one in ten thousand who would, for the sake of a hobby, undertake all the mess and labour connected with the bath process.

Many of us are prone to exercise an economy in small matters which too often turns out to be extravagance in disguise. Perhaps it is the outcome of that misleading proverb which tells us that if we take care of the pence, the pounds take care of themselves. But, whatever be the reason, many of us will take infinite pains to make for ourselves that which we can buy far cheaper and of much better quality than the home-made article. A sad instance of this recently came up at a coroner's inquest. The young lady assistant to a photographer, without the knowledge of her employer, essayed to make some retouching medium from a mixture of resin and turpentine, believing that she could make it much better than the usual manufacturers. She placed the inflammable mixture on an open fire, with a fatal result. Although the poor young thing did not actually die of her burns, they were the indirect cause of her death, for the debility which they brought about rendered her unable to withstand an attack of fever which supervened.

Londoners have already had one or two reminders that the fog demon is in their midst, and is ready to commence active operations on the slightest pretext. It behoves photographers, therefore, to make the most of the few bright days which may be vouchsafed to them, for they may be quite sure that there will not be much sunshine during the next few months. Taking the December of 1890 as a guide to the probable conditions of the ensuing month, we find that the sunshine recorded was as follows at the different stations. Eastbourne came first, but even that bright seaside haunt could only boast of 38·0 hours of actual sunshine, although, no doubt, it had plenty of fine days upon which the sun was but thinly obscured. Woburn comes next with 13·4 hours, Greenwich with 2·4; Kew had only eighteen minutes, and the weather clerk at the station at Bunhill Row was only able to register six minutes of sunshine for the whole of the month.

If meteorologists would only prophesy better things for us in the future, we could breathe the fog-laden atmosphere with a little more equanimity, but they tell us that things are getting worse instead of better. Each year shows a palpable increase in the number of dark days, and we must expect this increase to go on until it ends in continual darkness, when photographers will find their occupation gone altogether. The only remedy lies in the possibility of persuading householders to give up the burning of coal, and to substitute for it gas and coke; for the bulk of the fog demon's stock-in-trade comes from the imperfect combustion of coal. We should still have fog if the coal nuisance were done away with, but it would be of the clean variety, like the white mist that blows in from the sea over the hills in South Devon—a mist which leaves no oily residue behind it, and which always has a "silver lining."

Adventurous travellers who are also photographers would do well to read up the experiences of their predecessors who have essayed to take the portraits of savages. The latter have very strong opinions on the subject. The matter is exhaustively treated by M. Lagar Popoff in the *Revue Scientifique*. M. Popoff says that, in a tribe of Western Africa, it is dangerous to make a portrait of the natives, because they are afraid that, by some kind of sorcery, a part of their soul will pass into this image. Of special interest to photographers is the observation of Sir John Lubbock that the more like the portrait, the greater the danger to the original, for the more life there is in the copy, the less must be left in the person. Catlin tells a story that, when he was drawing the profile of a chief named Matochiga, the Indians around him seemed greatly moved, and asked him why he did not draw the other half of the chief's face. Said they, "Matochiga was never ashamed to look a white man square in the face," and one remarked to the chief sportively, "The Yankee knows that you are only half a man, and he has only drawn half of your face because the other half is not worth anything." The result of this remark was a fight, in which Matochiga was killed by a bullet which struck him in the side of the face that had not been drawn. It is certainly a singular fact that, no matter what the quarter of the world may be, savages have a horror of photography.

The value of a telescope of high power is now being tested by Professor Holden, who is making a series of photographs of the moon with the assistance of the Lick telescope. A projection on the surface of the moon fifty feet high casts, it is said, a shadow large enough to be distinguished through this telescope, and if Professor Holden should discover some day a new shadow where none had been cast before when the moon was at the same position, and under the same light, he would know that something had been erected on its surface, either the result of some internal movement, or, possibly, a building put up by living creatures. If the inhabitants of the moon are sufficiently advanced in astronomical science to take similar observations of the surface of our earth, the Eiffel Tower must puzzle them not a little.

Photography has an awkward habit of running counter to the theories of scientists. For instance, it has long been held that forked lightning has no ramifications—that is to say, it has a single path, and does not spread into branches. A photograph taken by a correspondent of *La Nature*, and figured in the last issue of that journal, contradicts the theory. The photograph was taken during the night of July 26th, 1891, at St. Palais-sur-Mer, at the mouth of the Garonne, and M. Tissandier, who records the phenomenon, says that the photograph shows details which the eye could not discern. The figuration shows a multitude of forked streams of light altogether new in one's experience of lightning.

## SUN-SPOTS.

BY JAMES MEW.

Wieland, in one of the cantos of his "Oberon," tells how, when Huon and his beloved Rezia have been cast upon a desert island, the knight, after much difficulty, procures for his starving sweetheart a glowing fruit, which he holds up before her closing eyes in the last red rays of the setting sun. Rezia recovers a little strength at the gracious sight, and thanks heaven in a short extempore prayer for its providential munificence. But when Sir Huon cuts the fruit—upon which the lady's hope, but nothing else of her, had already fed—in twain, he finds the gorgeous golden apple mouldy to the core, and more bitter than the bitterest gall. This story of disappointed expectation may be well applied to the majority of mundane matters, and among them to the history of sun-spots. Since the time of their first discovery—a time very remote, probably, if, as we are assured, they can be sometimes seen with the naked eye—cause after cause has been assigned with anxious persistence for their appearance; cause after cause which, for a season, has satisfied the sense of scientific curiosity, but has been found, on more prolonged examination, wholly unsatisfactory or absurd.

Of the many respectable opinions on this subject given at various times by celebrated astronomers, since Thomas Harriott, in 1610, drew his two hundred diagrams, the first—if, indeed, he was the first—to transfer to paper these interesting phenomena, some few may, perhaps, excite the languid interest of the ordinary reader of the present period. Spots have been supposed to be planets revolving round the sun, crusts like the scum of boiling liquor in a saucepan, excavations, rocks, clouds, masses of sulphur, and vomiting volcanoes. But the strangest conception of all about them was that of Tobias Swinden, M.A., a rector of Cuxton, in Kent, who, just a hundred years ago, gave out his idea—rather, as was to be expected from his office, religious than scientific—that they were probably clotted companies of the souls of the damned. Passing over the opinions of Bruno, Kepler, and Fabricius, we come to a work wholly taken up with sunspots, bearing the bizarre title of "Rosa Ursina, or the Ursine Rose."

Christopher Scheiner, the author of this remarkable production, a folio volume containing some eight hundred pages written in Latin, and published in 1626, was a German astronomer and Jesuit. He devised considerable improvements in the helioscope, and disputed with Galileo the honour of having first discovered sun-spots. How far either of them is entitled to this dignity is by no means clear. The fantastic title of his book was chiefly due to its being dedicated to a certain Paul Giordano Orsini, a duke of Bracciano, whom he addresses in his preface in terms of the most extravagant and fulsome flattery. These terms were, however, probably the outcome partly of Scheiner's want of pence, and partly of the naughty fashion of the period in which he lived. The book, we find, was printed by the duke's printer, and, it may be safely concluded, at that dignitary's expense. Punning on the duke's name, Scheiner says he has fashioned his book with the same care with which a bear licks into shape her cubs, and a picture of that interesting business is presented to the reader, the more to impress the matter on his memory. The Orsini family, according to Scheiner, has the nature both of the sun and the rose; its colour and splendour is diffused throughout the world. Earth, indeed, is not large enough to contain the glory of that family, therefore the sun and the bear run to execute its orders in the skies.

It is interesting to note, after this panegyric, that this particular duke, Paul Giordano, strangled his girl-wife, Isabella, one night with a rope which he had hidden under his pillow for that purpose. He had, it is said, conceived some quirk of jealousy arising from her father's extreme affection for her.

Perhaps Scheiner's book is the most important contribution to what some egregious person has called by the detestable name—happily not yet admitted into our dictionaries—of "sun-spottery." The sun shall give you marks —*sol tibi signa dabit*—is his motto, wittily chosen from Virgil's "Georgics." The Jesuit's volume, accordingly, contains some four score pictures of these marks, carefully designed by him from A.D. 1618 to 1677. Certain marks are these, he assures us, and not the bastard offspring of any failing or fallacy of sight. He gives an exquisite explanation of the telescope, or optic tube, as he calls it with the author of the Paradise Lost, through which he inspected these solar marvels, and describes a machine by which such phenomena may be still more easily observed. Having regard to the title of his book, he compares the numerous difficulties he met with in the investigation of his subject to the thorns which surround the rose. In the successive unfoldings of the leaves of that flower he sees reflected the results of his daily investigations, conducted, he declares, with long patience and indefatigable study. "Oh happy souls!" he says, referring perhaps to himself and his companions, or perhaps to earlier astronomers, "Oh happy souls of whom it was the care first to study such things as these, and to ascend into the heavens' starry homes!" The original, in the "Fasti" of Ovid—

> "Felices animæ, quibus hæc cognoscere primis
> Inque domos superas scandere cura fuit."

has, in our later days, met with a translation which would certainly have surprised the learned Jesuit, so wholly diverse is it from his own version: "Oh lively cats! whose especial concern it was to look after these matters, and always to climb on to the tops of our roofs."

Scheiner did much for sun-spots; he divided them into classes, simple and mixed; he noted their different colours, white, green, blue, brown, and yellow, and tabularised their changes of brilliancy; he grew eloquent about their shapes, round, oblong, triangular; he found some spots equal in size to Europe and to Asia, and others larger than all Africa; he noted the celerity of their motion, and found them quicker in the south than in the north; he observed their increase and decrease, and declared that the former was not by rarefaction only, nor by superficial extension only, nor by alteration only, nor only by local motion. He gave instances of many spots coalescing into one, and wrote much about the relation of maculæ and faculæ, the dark and the bright; he proved them to exist by daily motion, and the absence of parallax; and he did a great deal more, which anyone who cares to consult the original may see for himself.

It was a distinct epoch, the beginning of a new era, a red-letter day in the calendar of astronomical research, when photography at last, after encountering and vanquishing, like a second St. George, that well-known—too well-known—dragon of ignorance, the spectre on the threshold with which science must needs wage internecine war, achieved the hard won but fully deserved position of assistant inspector in all departments of stellar observation and research. The true story of the photosphere or solar surface commenced with the portraits taken by the camera of those remarkable spots, varied and unstable as Proteus or a woman, which Nasmyth described as willow leaves, and Dawes as straws, and Stone as rice grains, and Spörer as macaroni. When doctors disagreed, as doctors, even the best of them, will disagree, in the resultant impressions of their study of these solar phenomena, who was to decide the matter, unless the camera?

Surely the best means of studying the sun was by the sun itself, and the camera failed not. It showed that all these varied images were true under varied conditions. It was the old story of the chameleon once more repeated. When the surface of the sun was calm, then we had the rice grains; when it was disturbed by gaseous currents, lo! there were the willow leaves. Nothing could be more simple or more satisfactory; but alas for these photospheric accidents! There was disagreement among the doctors still. In July, 1882, came a sudden outburst of spots in the north-west provinces of India. Photographs were taken of this outburst. Apparently all was well, and would, no doubt, have continued so, had not the demon of discord—a second Satan in the celestial regions—whispered something about blemishes on the negatives. *Ibi omnis effusus labor!*

The appearance of spots seems altogether arbitrary and capricious. Tacchini found two hundred and ninety spots in five months in 1871, and during the same period in 1876 only twenty-four. When these eruptions in the solar mass are few, says one authority, we may believe that the sun is in a condition of comparative repose. The truth, says another, is rather the reverse; spots then break out and vanish with much greater rapidity. On April 14th, 1877, Janssen could discover no spots; on the next day they were clearly seen in considerable numbers. The daily solar photographs in the observatory at Kew give equally conflicting pictures. At present the generally accepted opinion is, that sun-spots are openings in the shell or rind of fluid fire through which the darker interior is exposed. Not otherwise, indeed—to compare small things with great—is discovered the blackish, indigestible compound of a wedding cake when we remove a portion of the snowy surface—technically known to pastry-cooks as the "ice." Sun-spots, cavities down which, we are told by the learned, hydrogen rushes at the rate of forty miles in a second, are rare at the equator, move at different rates of speed, circle our greater luminary in twenty-six days, vary in numbers, and last for uncertain periods—some, like the dragon-flies, having an ephemeral existence, others maintaining for a month their vital energy. Schwabe, who is said to have studied these spots, nucleus, umbra, penumbra, and thatch, for some half a century of years, supposes that there is in every dozen annual revolutions a recurrence of their maxima. The last maximum was in 1882. The number and extent of spots has been lately largely increased; we are fast moving onwards to another maximum. People, other than those interested in astronomy, may receive this announcement with cold indifference. When a fire is raging a mile off, we gaze at the smoky glow in the sky with comparative unconcern; but it becomes another matter when our neighbour's wall is burning. Then, indeed, our sympathies are aroused; then, with the amiable philosopher in Terence, we think all that is human nearly concerns ourselves. So, if he reads onward, the most careless of men may feel an interest in the spots on the sun.

An extraordinary power has been given to them. They have been held—as eclipses were once held, while their causes were unknown—to influence the season's changes, the price of wheat, the course of trade, and the general estate and condition of man. This is a throwing back to astrology, and should increase the sale of Zadkiel's Almanac. Between the time of the South Sea scheme and the present, some fifteen commercial crises have, we are informed, arisen, all of which have been connected by the ingenious with the appearance or disappearance of sun-spots. It has been shown, to the satisfaction, at least, of the showers, that the price of food rises and falls as spots are few or many. One able observer went so far as to find in them enemies to a political movement. As the stars in their courses fought against Sisera, before that true and single-hearted Jael brought him butter in a lordly dish, so spots on the sun fought, in the conceit of that observer, against the Irish Land League. Scoffers have regarded all this in the light of idle talk. They have asked whether the prices of food have been affected by sun-spots simultaneously throughout the globe, or whether Great Britain is alone concerned with them? They have inquired whether to these may be also attributed the alarming rise in the value of oysters? In fine, these sceptics have looked on spots on the sun as of far less importance—in the matter of astrologic prediction—than the spots on their own faces. But when they have been shown that not only Africa, as the old Jesuit says, but the whole of our globe can be easily contained in one of these spots, could pass through them, indeed, as easily as a pea through a pea-shooter, they may possibly—but they are a stiff-necked generation, and God, as the Arabs say, is the most knowing—see fit to alter their opinion.

## ORIGINALITY IN POSING AND LIGHTING.

BY XANTHUS SMITH.

MY attention has been called to "Originality in Posing and Lighting" as a subject appropriate for some remarks by me, and, while at first sight it would appear to offer an opportunity for the production of a paper embodying some new and good ideas, a further consideration of the theme brings one to the question at the outset, whether there truly can be such a thing as originality displayed now in posing sitters and lighting them? We certainly must admit that, if anyone could point out an entirely new path for the portrait photographer—one which would lead him to show cases filled with fascinating pictures of such handsome looking people that every passer-by would not only be attracted by them, but would be seized with an inevitable desire to be portrayed in the same style—a great benefit would be conferred upon not only the photographer, but the public generally.

Unfortunately for the explorer in new directions of portraiture, there are some barriers as insurmountable as the great ice wall of the Antarctic regions. We have to deal with things as we find them. Could we reconstruct our sitters, and remould them in conformity to individual freaks of taste and fashion, then, indeed, would there be new and startling ways open to us for posing and lighting. If, on placing a sitter in the posing chair, in addition to twisting and tilting his head about, we could reshape his features in the same manner that a lump of putty may be dealt with, then only might we set at naught those critics who scoff at the old conventional three-quarter face with a top and side light somewhat in front. But this we cannot do. The head is globe-shaped; the nose, except, perhaps, occasionally in the case of pugilists, is always the most prominent feature, and, as the laws of light and shadow are inexorable, we must abide by them.

Undoubtedly novelty is always attractive. It is attractive by virtue of its newness. But it is not always agreeably attractive—as we see in the matter of novelty in dress; what strikes one as elegant and appropriate appears entirely the reverse (indeed, often quite absurd) to another —and where there are certain principles and rules of good taste governing a matter, as is particularly the case in the making of portraits, by reaching after new and startling effects, while we may attract a few untutored or unthinking people, on the other hand we may be lowering ourselves in the estimation of the more sensible majority.

The matter of posing and lighting sitters occupies an entirely different place to-day from that which it did ten years ago. During the last decade, owing to the large incoming of amateurs, the amount of experimental and accidental work which has been done may be said scarcely to have left a single untried pose or effect of which photography is capable.

Prior to the adoption of the dry plate there were very few amateur photographers, and by far the majority of those who practised the art devoted themselves to landscape and architectural subjects. The professional photographer, of course, always worked in a skylight constructed in accordance with certain established rules, thought best for lighting sitters; and, therefore, pictures of people taken off-hand, under every-day surroundings and conditions, were very rare. Now, it may fairly be said that everybody photographs, from the schoolboy to the man grey in years, and the fair sex, young and old—the latter furnishing us some of our finest productions of the art; and a large portion of the work done by these numerous and busy amateurs being portrait work, do we not have an opportunity of beholding the utmost originality displayed in posing and lighting, including both studied and unstudied effects? And how often, after all, do we see amongst this multiplicity of work any that will compare in success with that of the professional photographer possessed of knowledge and good taste—open as his work may be to the criticism of conventionality? And why? Simply because, as I said at the outset, there are certain laws of nature and certain rules of good taste governing the whole subject, which cannot be set aside without offending.

Simply touching upon the matter of a certain propriety and grace in attitude, which the rules of society call for, and which we dare not stray from without becoming vulgar or ridiculous, in lighting alone, of all heads which we see posed by untutored amateurs in ordinarily lighted rooms, under porches and amongst shrubbery, what do they amount to? How many in the hundred fill the place to those who wish to have their picture taken, and be done justice to, of the regularly posed head in a proper skylight? All that we can say of the most of such work is, that it is beneath criticism as portraiture.

Turning, then, to the work done by the best professional photographers, we find them constantly striving for novelty, partly through a desire to produce something which is more excellent, in an artistic way, than what has yet been done, and partly to attract sitters, and thereby increase the business and the income, and we find that, just in proportion as they deviate from certain limits, and run into the new and the startling, just in so much do they run the risk of producing effects which pall upon the taste of the observer when the brief pleasurable sensation of the first impression has worn off.

Take, for instance, a handsome lady, place her in a natural, easy attitude, with the "old conventional top and side light somewhat in front," and, having secured a calm expression, so photograph her; and then photograph her again, posed elaborately, with her head twisted in an opposite direction from her shoulders, and thrown very much up, and the face wearing a bewitching smile, and lighted in any way you please except that adopted in the previous portrait; and of the two pictures see which will be likely to give the most lasting satisfaction, will be the best suited to go down to posterity as a likeness of the lady. Of course, the more we include in our portrait subjects, the more we enlarge our scope for originality in composition. When we make whole-lengths, and groups, with accessories, we can give scope to what fancy may dictate to us; but our difficulties then increase many-fold. The present attire of the male, though comfortable, can neither be said to be very dignified nor graceful, and, just in proportion as we admire the latest attractions in dress of our female friends at the moment of their production, so do they seem out of place or absurd to us when they have been set aside some months, subsequently to give place to others.

To be convinced of the unpleasing effect of peculiarities in costume, we have only to look at any collection of full-length photographs extending some years back. The more elaborately the individuals were gotten up for the occasion, and the more imposing the effect striven after, the less do we see in the picture to seriously interest us. We find ourselves at once critics of costume and furniture, instead of admirers of humanity.

Let those who have the opportunity of doing so, and are sufficiently interested in the subject, go and examine the fine display of work in the show windows of leading photographers, where the proprietors deal with the best trained of society, including those prominent on the stage, furnishing the best means for a display of originality in costuming, posing, and lighting, and see how narrow the line of propriety is, and how, in striving after a new pose or effect, for one successful hit we are only too apt to have to point to a dozen failures.

In conclusion, we must say that we give up the problem of pointing out any strikingly original scheme in the art of posing and lighting sitters for their portraits, and can only suggest that in securing softness and breadth of light and shadow, ease and general simplicity, we are always working in a safe direction.—*American Journal of Photo.*

---

Photographic Society of Ireland.—At the meeting on the 13th inst. (Mr. George Mansfield, J.P., in the chair), Mr. H. M. Smith, of the Eastman Company, gave an exhibition of lantern slides made from kodak negatives.

Decimal Weights and Measures.—A communication has just been received from the British Consulate at St. Petersburg to the effect that in Finland the use of metric weights and measures will shortly be compulsory. For some time past there has been a decimal coinage, and the metric weights and measures have been obligatory for the Custom House, the State railways, the Post Office, and pharmaceutical chemists, but after 31st December next the old system of weights and measures will no longer be permitted in any public or private establishment. The measurement of public roads has already been changed from *versts* to *kilometres*. In Russia the metric system of weights and measures is already used by medical men and chemists, and its general adoption is more than probable.

## THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

A MEETING of the Council was held on November 9th at Anderton's Hotel, Fleet Street, London, the president, Mr. H. J. Whitlock, in the chair. There was a large meeting of the Council, representatives from the North, Midlands, Yorkshire, Devonshire, London, &c., being present.

The appointment of Mr. D. J. O'Neill (of Birmingham) as secretary was unanimously confirmed.

Considerable progress was made with the general business of the Association, occupying the Council several hours; and a further meeting was held on November 10th.

The vexed question of certain firms of "enlargers" supplying private persons, entirely outside the pale of *professional* photography, with trade lists and trade prices, was carefully considered. These firms, for a long time past, have been doing the work indiscriminately for the public at the same price charged to the professional photographers. The Council decided to bring this great injustice and unfair dealing to the notice of these firms, with a view to a proper trade list for materials and work being issued, for the protection of the professional photographer. The secretary was instructed to inform these firms of this decision. There is a strong determination on the part of the members—and the profession generally—to do business only with those firms who deal fairly with them in this vitally important matter. The secretary was instructed to convey the thanks of the Council, and promise of support, to several firms who have already issued lists protecting the profession from such unjust dealings.

The first annual meeting of the Association will be held on the second Thursday in February, 1892, at 7.30 p.m., at Anderton's Hotel, Fleet Street, London, at which all professional photographers will be heartily welcomed by the Council.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Nov. 26th, "Protecting the Negative during Printing"; Dec. 3rd, "The Exaggerated Perspective of Wide-angle Lenses"; Dec. 10th, "Warm Tones in Lantern Slides."

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the technical meeting to be held on Nov. 24th at 50, Great Russell Street, the subject for discussion will be "The Negative, and how to make the best of it." An example of photography in colours by Becquerel's process will be shown.

A CORRESPONDENT of *Help* thus describes his method of using the limelight for lantern projection:—"I have a bi-unial lantern, and use both hydrogen and oxygen from cylinders, as supplied by the Birmingham Oxygen Company, using Beard's regulators on each bottle, and find very little trouble therewith after once regulating the same. Where there was gas to be obtained, I dispensed with the hydrogen, and attached the tube to the nearest gas bracket. I found this was not so good a light, and I set to work to make it better, and got a tinman to make me a sheet-iron cylinder, 15in. long, 4½in. diameter, with a gas stop-cock at each end; inside I put a 1½in. spiral spring wrapped round with wadding. I charge this with benzoline, and allow it to drain, and then attach to tube between gas and jet. The gas gains in brilliancy twenty-five per cent. by going through this cylinder. For screen frame 16ft. square, I use ½in. gas piping (iron), cut into sixteen lengths 4ft. each, and have by me four 2ft. lengths, so that I can use a screen 8ft., 10ft., 12ft., 14ft., 16ft., or 18ft. square. I use the blow-through jet, and find the Nottingham hard limes are the best to use. The average expense for one exhibition, including hire and carriage of slides, gas and carriage, conveyance of apparatus to and from place of meeting, is eighteen shillings."

## Reviews.

SUN ARTISTS. Number 8. *(London: Kegan Paul, Trench, & Co.)*

THOSE who have made themselves acquainted with the beautiful photogravures issued during the past two years by this ambitious publication, will regret to learn that with the present issue the series comes to an end. The honorary editor gives a half promise, however, that publication may be renewed on broader lines later on. The concluding number is up to the high average of its predecessors, the works reproduced being those of Mr. Sutcliffe. These are, as usual, four in number, and the pictures selected are "Water Rats," "Dinner Time," "Excitement," and "Sunshine and Shower." These pictures are too well known to need a word of comment. We understand that some sets of previous issues of *Sun Artists* are still to be had, and those who are interested in the artistic side of photographic work cannot do better than secure them.

LIGHT. An Elementary Treatise by Sir H. Trueman Wood. *(London: Whittaker & Co.)*

THIS is a well-written manual, forming a volume of Whittaker's Library of Popular Science. It is by no means an easy matter to write in a simple and easily understood way of such subjects as interference, diffraction, spectrum analysis, fluorescence, and polarized light; but the author has done all this in the book before us most successfully. The volume will therefore be eagerly read, and probably largely borrowed from, by teachers in elementary schools. We are sorry that the illustrations are not original. There is a growing practice among writers of borrowing electros from other works, and it is one that cannot be commended. A good book is worthy of new illustrations.

AN INTRODUCTION TO THE STUDY OF BOTANY. By Edward Aveling, D.Sc. *(London: Swan, Sonnenschen, & Co.)*

PHOTOGRAPHERS cannot, in these days, afford to be ignorant of any branch of science, for photography is the handmaid of all. If they want to get an insight of the principles of botany, they cannot do better than study Dr. Aveling's volume. It is written in a simple manner, and readers are not frightened away by a glance at the first chapter, which is our experience of certain text-books which might be named. The 300 pages contained in the volume include nearly as many illustrations, and a glossary of more than 600 words. The book is well printed, and turned out generally in a very creditable manner.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The third annual exhibition was held on November 16th, when about 400 pictures were on view. These were judged by Messrs. Cembrano, Pringle, and Leon Warnerke, and the following were the awards:—Silver medal—C. H. Oakden, for best general exhibit; special bronze medal—Mr. H. Esler, ditto. Silver medals—E. A. Whitby (best picture, half-plate and under), T. S. Bailey (best picture over half-plate), T. C. Kirby (portraiture). Bronze medals—W. Howell (local views), W. Rice (lantern slides). Mr. Edwards' work was not for competition. The exhibition was of a much higher class than last year, and the room was at all times well filled. The subject for Dec. 7th will be "Photographic Optics," by Mr. Crouch; Dec. 21st "Printing Process," by Messrs. Edwards, Herbert Whitby, &c.

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

19,056. Henry Vander Weyde, 53, Chancery Lane, London, "Improvements in Reflectors and Appurtenances used in Electric Light Photography."—*November 4th.*

### Specifications Published.

19,714. *December 3rd,* 1890.—"Improved Focussing Attachment for Photographic Instruments." J. P. Bayly. (Frederick Quimby, of Quincy, Mass., U.S.A.)

This invention relates to an improved focussing attachment for photographic instruments, and comprises a hood or bonnet provided with means for attaching it to the focussing screen of the camera. Two projecting eye-sockets are held on the hood at its end opposite to that attached to the focussing screen or plate, and these two eye-sockets are joined by a nose bridge held on the hood. A cord is attached to the two sides of the hood, and is adapted to pass around the head of the person looking through the eye-sockets. The hood can be telescoped or lengthened without the aid of the hands.

19,934. *December 6th,* 1890.—"Storing Photographic Plates." J. B. Brooks, 115, Great Charles Street, Birmingham.

This invention consists in a frame into which the glasses or negatives can be readily placed during the process of washing, drying, storing, &c., and is specially adapted for use in a darkened room. The frame is made preferably of metal, and has raised parts or divisions standing up prominently at each side opposite one another. These divisions are so constructed that the spaces are wider at the top, so as to readily admit the plates, and taper near the base, so as to fit the plate and keep it upright when slid into position. This frame is then inserted into a washing box or trough, the water passing into one end of the box and out at the other. For drying or storing, &c., the frame, if desired, may be pitched so as to cause it to drip at the corners.

20,653. *December 18th,* 1890.—"Detective Hand Photographic Camera." Sarah Tucker, Nethway, Cotton Lane, Moseley, near Birmingham, and William J. Spurrier, Queenswood Road, Moseley, near Birmingham.

The object is a magazine photographic comera, and it consists of a metal or other body fitted with the necessary lens, shutter, and fittings, and a magazine containing a supply of rims or frames for the sensitised dry plates, which magazine, when not in use, is carried in the camera, which is provided with a door to admit the same. To the top of camera is secured an upright rim with a catch or catches into which fit the corresponding projections of the slides of the magazine, which contains from six to twenty-four or more dry plates, and is constructed with a blank or block of greater thickness than the plate rims into which the plates are inserted, and to this blank or block is attached an arm extending to each side of the magazine provided with points extending below the lid. Between said arm and block is inserted an inner lid having a slot to allow the block, with indicator, to pass from one end of the magazine to the other. Each end of the bottom of the magazine opens with a sliding motion, allowing the outlet or inlet of the plate, and attached to these slides are the necessary projections. The magazine fits into the upright rim on the camera, and the projections on the slides fit into a catch or catches on the sliding cover, also on the camera. For the purpose of readily carrying the camera by hand, a loop handle is provided of such length as to allow it to be turned either over the camera or magazine, the ends of which are attached one to either side, and at the top of the camera. A focussing screen is also provided, jointed to the bottom of the camera, whereon it will lie; it can be raised into position by a suitable catch.

15,615. *September 15th,* 1891.—"Photographic Apparatus." W. P. Thomson. (E. E. Moore, of Syracuse, New York, U.S.A.)

Relates to devices for registering and indicating the number of exposures made, adapted to use a continuous strip or sheet of film, or sensitised paper of any kind, which is mounted upon rolls in a frame detachable from the case or otherwise. The object is to register the exposures so that the operator can always know the exact number remaining not used, by means of a geared and numbered disc or dial, and a differential feed gear meshing therewith, and actuated by the rotation of the axis of an idler roll upon which the feed gear is mounted, and which is frictionally rotated by the contact of the sheet of film therewith whenever the sheet is moved by the winding up of it into the winding-roll after each exposure.

## Correspondence.

### DERBY PHOTOGRAPHIC SOCIETY.

Sir,—I have been elected hon. secretary to the above for 1892, and lately have been receiving correspondence wrongly addressed often three or four days late. I should esteem it a favour if you would kindly insert my correct address in your next issue. Thanking you in anticipation, I beg to remain,

9, *Church Street, Derby.* Thos. A. Scotton.

### CAMERA CLUB.

Sir,—Will you kindly allow me to state that the exhibition of Mr. Ralph W. Robinson's photographs now at the Camera Club will close on Friday, November 27th.

G. Davison, *Hon. Sec.*

*Charing Cross Road, W.C., Nov. 16th.*

### LEEDS PHOTOGRAPHIC EXHIBITION.

Sir,—Will you kindly draw the attention of your readers to the fact that the committee, in response to the application of a number of exhibitors, has extended the time for receiving entries and exhibits until Thursday, November 26th.

Geo. Birkett.

*Municipal Art Gallery, Leeds, Nov. 14th.*

### DR. MADDOX AND DRY PLATE PHOTOGRAPHY.

Sir,—Is Dr. Maddox the father of the present system of dry plate photography? It has been the fashion for a long time to say that he is, but the writer of these lines knows, and feels bound to say, that he is not. If Dr. Maddox had never existed, gelatine dry plates would have been just what they are to-day. In 1873 an emulsion was put into the market quite perfect—and, for ordinary purposes, as good as any made now—by a man who never heard of Dr. Maddox until the said emulsion had made an immense sensation. They say Burgess took the hint from Maddox. What hint? Dr. Maddox made a wonderful plate 180 times slower than wet collodion, upon principles the very opposite to those now employed in making gelatine plates, and yet, forsooth, he is the father of them!

Kind reader, if you have the slightest regard for historical accuracy, don't go to the so-called histories, but hunt up the old records in the journals of twenty or thirty years ago, and there you will find a dozen pins to prick the gelatino-bromide bubble that is now in process of inflation.

Another time I will tell you just where to find them, but at present I will content myself with pointing out one fact. If Dr. Maddox had designed to conceal the most valuable properties of gelatino-bromide—speed and power—he could hardly have hit upon a more effectual formula than that with which he rushed into print. Not because he believed in it, but, as he says, to please his friend, Mr. Traill Taylor, in an emergency. All that that experiment teaches is how *not* to do it, and for that he had a gold medal. What a topsy-turvy world this is!

J. Burgess.

Fry Manufacturing Company.—The next lecture and demonstration is fixed for Nov. 27th, upon the subject of "Bromide Enlarging," and will include methods of working by daylight and artificial light, Griffith's enlarging cameras, exposure and development, vignetting, printing-in skies, and the acid fixing bath.

# Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At the meeting of this Society held on the 12th inst., Mr. J. Traill Taylor occupied the chair.

The question of the evening, "Cau Halation be Prevented by Staining the Film in any way?" was introduced, the Chairman remarking that Col. Stuart Wortley recommended yellow stain to be added to collodion emulsion for the purpose.

Mr. W. E. Debenham had experimented some years since with staiuing gelatino-bromide plates to prevent halation. The stains he had tried were saffron and logwood. Both, however, decreased the sensitiveness, the saffron-stained plate requiring about double normal exposure, and the logwood still longer. Halatiou was prevented in cases not very trying, but the results he got were not equal to those obtainable with a good backing.

A member suggested that with a staiued film the image would be thin, as the light would not penetrate deeply into the film.

Mr. Debenham replied that he had not noticed any thinuess of image. It must be remembered that, as Capt. Abney had demonstrated, development was uot confined to particles directly acted upon by light, but was continued iu the adjacent particles.

Connected with halation, though not with film staining, Mr. F. A. Bridge described a receut experience with a very trying subject—the interior of a vessel with portholes open—and had obtained a very satisfactory result by backing with caramel and burnt sienna.

Mr. T. Bolas thought the method of coating on flashed ruby glass aud subsequent stripping a good oue. He did not think the risk run in stripping so great as was supposed. It might be interesting to try some stain chemically inert as regards the sensitive film.

The discussion next turned upon the intensity of collodion negatives, and Mr. Debenham said that he had noticed that old collodiou uegatives had become more iutense with keeping. On looking out any old plate he generally found that, whilst originally it might not have been at all too intense, it had changed in that respect, and would now only yield a hard print. It was the fashion with some who had recently entered photography to assume that great intensity was almost universally characteristic of earlier production, and whether or not this might be the case with very early work, it certainly was not so any time within the last thirty years.

The Chairman's experience supported that of Mr. Debenham as to the gain in intensity of old collodion negatives. He had a number of old trausparencies, aud would look through them, and bring up the matter at a future meeting. With some intensifiers the negative gained in density afterward. This was notably the case with Sell's uraium and ferricyanide process. As this process was uow used for toning bromide prints, and the colours obtained were very beautiful, it would be interesting to know whether the prints were as liable to chauge as the negatives were.

Mr. Weir Brown said that he had brought a pareel of such prints to the Society for experiment some months since. The curator had charge of these prints, and they were being exposed, one half to light, and the other half covered. In due time they would doubtless be produced for examination.

A question from the box was read: "Can a negative produced by a pinhole be as sharp as one produced by a lens, and if so, how?"

Mr. P. Everitt said that he had noticed a photograph taken at Southampton by Mr. Henderson, and stated to be produced by a pinhole, which was as sharp as could be produced by a lens.

Mr. Bolas thought that a little misunderstanding might arise from the use of the expression "pinhole stop," when a small stop in conjunction with a lens was meant. Perhaps this particular photograph might have been produced with a pinhole stop and lens.

The Chairman thought that this was probable. A pinhole without lens could never yield a really sharp negative, as when reducing the aperture below a certain point, diffraction would step in.

Mr. Cowan said that Mr. Henderson had made a distinct statement that the photograph iu question was taken without a leus.

Another question was: "Can a large back lens be fitted to an ordinary portrait lens for lantern purposes at a small cost?"

The Chairman said that a lens specially constructed to order was never of small cost. Going to the blackboard, he showed the advantage of a large back lens in letting iu more light, and of introducing negative spherical aberration to obtain a flatter field.

Mr. Debenham said that he had an aplanatic lens of the Steinheil or rapid rectilinear form by Suter, iu which there was a small amount of negative spherical aberration. There was not more than the positive spherical aberration common in lenses of this type, so that the definition was good. The remarkable point was the flatness of field, which made it, in his estimation, the most useful lens one could have.

The Chairman had oue of these Suter lenses, which he prized highly.

Mr. A. S. Newman was elected a member.

CAMERA CLUB.

On Monday, Nov. 9th, Mr. Lyonel Clark gave the second lecture in the course of elemeutary lessons to members. The subject was "Lenses."

On Thursday, November 12th, Mr. E. J. Humphery read a paper on "Photography by Artificial Light." Captain Abney occupied the chair. There was a very large atteudauce of members and visitors, about 120 being present. Mr. Humphery described and gave an excellent demonstration of his new methods of applyiug the light of magnesium burnt in oxygen to photographic purposes. The apparatus for taking portraits consists of a glass globe charged with oxygen, in which the magnesium wire is ignited, the globe being swung during exposure. Platinotype prints were made from two portrait negatives by exposure to another form of the same light, the exposure being only fifty seconds.

During the evening Captain Abney showed a continuous flash-lamp, produced by M. Nadar, of Paris; and the Hon. Secretary handed round a lantern slide carrier introduced by Messrs. Perkins and Co., in which, by a simple device, all danger of marking the surface of the slide by the fingers was obviated.

On Monday, November 23rd, Mr. G. L. Addenbrooke will give a lecture on "Cameras and Tripods." On Thursday, November 26th, Rev. F. C. Lambert, M.A., will read a paper on "Some Aualagous Aspects of Paintiug, Music, and Poetry," and will furnish musical and pictorial illustrations.

HOLBORN CAMERA CLUB.

At the meeting last Friday evening at 100, High Holborn, Mr. A. J. Golding in the chair, Mr. T. C. Hepworth, F.C.S. (president), gave an interesting lantern demonstration. Nearly one hundred slides were shown. The first showed the difference between slides printed by contact and priuted by reducing the same negative. He next showed slides on the various makes of slides, chloride and bromide, home-made and bought, &c. The next were a large number of slides of the Isle of Man, mostly geological, showing rocks, &c. The concluding portiou of the demonstration comprised a number of London street scenes. Amougst them was one entitled "Caught in the Act," showing a man standing ou the back of a water-cart pouring water into a large milk can, whilst standing near was a cow. Mr. Hepworth said it had been said that he had posed the subject, but it was not so. He had come upon it accidentally while out with his hand-camera. Mr. Hepworth ably pointed out the lessons learnt from the slides, showing the weak as well as the strong points of them.

WEST LONDON PHOTOGRAPHIC SOCIETY.

*November 13th.*—Mr. Bilton in the chair.

The Secretary exhibited a plate showing effect of improper drying of the emulsion; Mr. Whitear, two negatives showing markings produced by placing common brown paper between the plates after exposure ; Mr. Holmes, several prints on aristotype and celerotype, and the Ilford new paper ; Mr. Rogers, the "Graphic" hand-camera, made by the Stereoscopic Company, and one on the same pattern made by himself with improvements ; Mr. Winter, a new very thin and light single slide for films, and a focussing screen to be used in connection with the same ; Mr. Varden, a hand-camera of his own design and manufacture, with swing-back and a novel arrangement of inserting and changing plates, as also a new form of tripod designed by himself, more especially for cyclists ; Mr. Leslie Selby, some platinum-toned prints on silk ; and Mr. Hodges explained the uew method of printiug on platinotype paper by artificial light, just iutroduced by Mr. Humphery, the originality of the idea being doubted by Mr. England.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

*November 17th.*—Mr. J. TRAILL TAYLOR in the chair.

Questions having been asked from the question box as to the use of Scott's warm air saturator, enlisted a variety of opinions as to its usefulness, but without any definite result.

The CHAIRMAN brought forward a circular to be issued with reference to the proposed public recognition of the services of Dr. R. L. Maddox, in connection especially with the discovery of the gelatino-bromide process.

Mr. F. A. BRIDGE then gave a demoustration of the process of bromide printing, defining the process as consisting of exposure, development, and cleaning, washing, fixing, and washing again. For development he preferred ferrous oxalate to any other developer, his formula being :—

| | | |
|---|---|---|
| No. 1.—Oxalate of potash | ... ... ... | 2 pounds |
| Hot water ... | ... ... ... | 3 quarts |
| Acetic acid ... | ... ... ... | 6 drams |
| or | | |
| Sulphuric acid | ... ... ... | 2 drams |
| No. 2.—Protosulphate of iron | ... ... | 2 pounds |
| Hot water ... | ... ... ... | 2 quarts |
| Sulphuric acid | ... ... ... | 1 dram |

with a bromide of potassium solution 1 in 40 to be used according to necessity. This formula was stated to be almost identical with that given by the Eastman Co. Formulæ for pyro development and for hydrokinone were also given, but these were not recommended, the ferrous oxalate process giving more rapidity of work, and producing better tones. Coming back to exposure, which was the key-note of all good printing, the lecturer insisted that the light used should be proportioned to the character of the negative, weak negatives being printed in a weak light, and even then often under ground-glass, with, in extreme cases, opal. For fixing, the best bath was hypo 3 ounces to the pint of water ; some had recommended the addition of ammonia, but its value was very doubtful. The great need in fixing was plenty—plenty of solution, pleuty of time—and then permanency might be looked for, even though the final washing might not be so thorough as usual. Should reduction be found necessary, a good formula was :—

| | | |
|---|---|---|
| Hypo solution ... | ... ... ... | 10 ounces |
| Water ... ... | ... ... ... | 30 ,, |
| Red prussiate of potash ... | ... ... | 1 dram |

but it must be used with great care, the action being very rapid. A great advantage in bromide printing was the facility with which good prints might be obtained from almost all kinds of negatives, the process allowing of dodging to a large extent. Cloud printing was not difficult, but required especial care in adjustment of masks, and in judging the relative printing value of the subject and cloud negatives respectively. Referring to the question of permanency, some very beautiful large prints were shown which were several years old, and were as beautiful as when first printed. Mr. Bridge then proceeded to expose and develop several prints, mixing the developer : Iron 1, oxalate 6, bromide of potassium a few drops. The exposures were to the gaslight in the room, the average time being five seconds, using Eastman's quick paper, which he preferred to slow paper, as giving by far the best results. The developments were in all cases successful, and a few prints were afterwards developed by hydrokinone, to show the difference in time and working. Remarking on the resemblance of bromide and platinum prints, it was shown by comparison that it was almost impossible, by any casual examination, to detect any difference. It was also noticed that length of soaking in water before developing was considered by the lecturer to increase the softness of the prints ; and for line subjects, and where great contrast was desired, it was best to use some old developer mixed with the new.

Mr. PARFITT showed a gas by-pass elbow for regulating the light of any burner instantly.

CROMWELL PHOTOGRAPHIC CLUB.

THE opening meeting was held in the supper-room of the Town Hall on Monday evening. Dr. BATELY (vice-president) occupied the chair. The president, Mr. R. H. Inglis Palgrave, was to have been present and given his address from the chair, but, in his unavoidable absence, he had sent the manuscript of his address, from which, as read by Mr. T. W. Swindell, the following is extracted :—"I am glad to have the opportunity of saying a few words on the manner in which pictorial art may be of interest to an amateur, from the hope that this may be a source of pleasure to many, as it has throughout my life been to me. And a study of this description is particularly valuable in a place situated as Yarmouth is, in which one of the great resources of interest and pleasure for the leisure hours of the busy and unoccupied hours of all—the opportunity of work in a garden—is a matter of difficulty to arrange for, aud through that difficulty almost unattainable by many, if not most of the inhabitants." After some remarks on the pleasures of gardeniug, the address proceeded : "The possession of a real hobby is a great comfort and help to a man, and the practice of photography has always appeared to me one of the best hobbies which a man can take up. It provides him with something which interests and amuses him wherever he goes, especially when combined with a genuiue admiration for the beauties of nature. I venture to say this because, though I have never practised photography myself, I feel that it is as much an art as the art of drawing and painting. Everyone can see this for himself by comparing a photograph of a view made by a skilful and one made by an unskilful artist. The first will take advantage of everything that is beautiful in the subject of which he desires to preserve a remembrance ; he will seize the best moment for light and shade, he will arrauge his camera so as to secure the best point of view, aud the result is that he will preserve a record which will be a pleasure to all who see it. The other—but I need not trouble you to listen to an attempt of mine to describe those errors in arranging a picture which all of you know how to avoid. All I need say is, that if you wish for a good illustratiou of the meaniug of the child's story called 'Eyes and No Eyes,' you cannot do better than look at the work of a bad photographer." The paper then dealt with the condition of pictorial art in Yarmouth some years since, and its influence ou the feeliug for art still existent in the place ; and concluded with an expression of the president's "that the studies of the Club would always be devoted to the delineatiou of that which is beautiful and pure."

Mr. PRICE read a paper entitled "Elementary Photography." Apologising for the lack of interest there might be to "old hands" iu such an elementary paper, Mr. Price ventured to hope that, at any rate, they would agree with him that, in the early stages of a photographic society, the papers read should be of such a character as to meet the requirements of those commencing the practice of photography, as no doubt many were drawn there in the hope of obtaining some useful elementary hints aud information. It was easy enough to take a negative, having the necessary outfit, but what was not quite so easy was to produce a *good* negative. He would impress upon them the importance of study, thought, and care. The best made and most expensive camera could no more of itself produce a good photograph than could a good brush paint a good picture—both required something behind in the shape of brains, and then wouders might be accomplished. The development of the negatives was, perhaps, the most interesting of all the processes conuected with photography, and one requiring the utmost skill and patieuce—skill in mixing and modifying the developer to suit the requirements of the subject, exposure, aud class of plate : patience in watching the result. Some technical information was here given which would, no doubt, be of assistance to many present. It was desirable to master one form of development, so as to have it uuder control. To be coutinually flying off after something new was to be continually putting oneself back. This was not intended to deprecate experiment with a desire to conscientiously test the value of different chemicals, but rather with a view of checking that illogical idea of a "royal road" to success which appeared to hover around the minds of some.

During the evening, lantern slides, the work of members, were shown through the lantern of the secretary, Mr. Rumbold, and a programme of music was carried out.

Richmond Camera Club.

*November 13th.*—Mr. Cembrano in the chair.

The discussion ou "Halation" was opened by Mr. J. S. Teape, of the London and Provincial Photographic Association. After demonstrating that the case of halation formed no exception to the rule that preventiou is better thau cure, Mr. Teape proceeded to show the results of various backings for plates with which he had experimented. He first showed a prism coated on one face in sections with (*a*) sienna with dextrine, (*b*) sienna with gum, (*c*) caramel with glycerine, and (*d*) caramel and sienna with gum ; showing that *a* and *b* had perfect reflecting power, *c* and *d* scarcely any. The spectroscope showed that caramel intercepts the green rays and all beyond. Mr. Teape then hauded round negatives and prints resulting from his experiments with the different backings mentioned, showing conclusively that caramel with glycerine was the most effectual, and that caramel and sienna with gum was nearly its equal (aud, being more quickly dried, more convenient), while sienna with dextrine came very well through all but the most severe tests. Mr. Teape concluded his able dissertation by giving formulæ for the backings he had used.

Mr. Ramsay showed the results of experiments with Dr. Cornu's formula (essence of cloves, &c.), and with a backing of black paper attached with glycerine—the former being effectual, but the latter of little, if any, use.

Birmingham Photographic Society.

*Nov. 11th.*—Mr. W. J. Harrison, F.G.S., in the chair.

Mr. Jones gave a lecture on "A Trip to Belgium, Holland, and the Field of Waterloo," illustrating the same with 130 slides from negatives taken by himself.

A number of slides by Mr. Wilkes and others was afterwards shown. The Society's lanteru was worked by Mr. Pettitt.

Newcastle and Northern Counties Photographic Association.

A meeting was held ou the 10th iust., Mr. T. Galloway in the chair.

The awards in the 1891 competition were declared as under, and the prints were on view. Confined to members :—Prints 5 by 4 and under (six entries)—W. E. Cowan, silver medal ; Jas. Brown, bronze. Prints $6\frac{1}{2}$ by $4\frac{3}{4}$ and above (nine entries) —T. O. Mawson, silver ; W. I. Tate, bronze. Enlargements (four entries)—Fred Park, silver ; W. H. Thorn, brouze. Lantern slides (thirteen entries)—W. E. Cowan, silver ; H. G. Ridgway, silver. Lantern slides, open class (eighteen entries) —J. Carpeuter, London, silver ; G. E. Thompson, Liverpool, silver ; P. H. Fincham, London, bronze ; J. W. Wade, Manchester, bronze. The judges were Messrs. J. P. Gibson, P. M. Laws, and C. J. Spence. It is to be regretted that in the classes for prints so few members exhibited, and the executive can scarcely feel encouraged to promote a similar competition in future years. In the opeu class for slides most of the principal exhibitors are represented, and the work throughout is of the highest quality.

A selection of the 268 slides sent in will be publicly exhibited at the Lecture Hall of the Lit. and Phil., Newcastle, on Wednesday, Nov. 25th, at 7.30 p.m.

Photographic Club.—November 25th, monthly lantern meeting ; December 2nd, "The Ferrous Oxalate Developer."

# Answers to Correspondents.

**All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.**

**Questions requiring a reply in this column, which have hitherto been addressed to Mr. Spiller (who, unfortunately, is unable at present to continue his efficient assistance), should be sent to the Editor.**

**All other Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.**

Photargus (Baleares, Spain).—Your proposed plan seems to be feasible. But why not apply to Messrs. Marion and Co., of Soho Square, London, who have worked out all the details which you are wanting? Their system answers admirably. We have had personal experience of it.

H. Griffin (Brockley).—See back numbers of the News. There have beeu numerous articles on residues and how to deal with them.

G. and W. Morgan (Aberdeen).—We do not know of such a book. Write to the Platinotype Company, 29, Southampton Row, W.C.

A. H. L. Newstead.—A very good formula for toning gelatino-chloride (aristotype) paper is that recommended by the Platiuotype Company as a developer for their paper. It is made up as follows :— Solution 1. Oxalate of potash, 5 ounces ; monopotassic orthophosphate, 3 ounces ; water, 50 ounces. Solution 2. Potassium chloro-platinate, 60 grains ; water, 2 ounces. Take three parts of 1, one part of 2, and add two parts of water. Be sure you get the true chloro-platinate of potassium, and not the ordinary platinum bi-chloride, usually sold in 15-grain tubes.

T. S. T.— A very perfect washing apparatus for prints is described iu the News for November 13th, on page 778. This plan would also do very well for washing films, where a large number are under treatment at a time. One of the best plate washers is that made by W. Tylar, 57, High Street, Birmiugham, and which he has called the "aquapoise."

M. P.—We cannot trace the cause of the marks. We should advise you to try another sample of paper.

A. H.—You are not legally bound to pay the railway fares. But if the men have worked well—as is implied by the raising of their wages—you might concede the point, especially as it is a matter of a few shillings only.

W. S.—The mixture used is bichromated albumen—taking the place of the bitumen originally employed for the same purpose.

F. A. B.—The mixture of four parts of potassium oxalate (saturated solution) with one part of ferrous sulphate solution (also cold saturated) is the ordinary ferrous oxalate developer. The salt known as "potassium ferric oxalate" has uo reducing power, but is seusitive to light, and serves, in consequence, as the basis of the kallitype and platinotype processes.

T. E.—For "ounces" read "grains." Thank you for calling attention to the error.

Doon.—The isochromatic plates which you have submitted to us are fogged probably by too much light from your red lamp. They are under, not over-exposed. Give full complement of ammonia at the outset, and use very little bromide.

Fergus (Dublin).—See answer to "Doon," and try the isochromatic plates for the purpose named.

Nemo (Cornwall).—There is undoubtedly a wide field for photo-etching work, but you must remember that there are always plenty of workers attracted by a new industry. Prices are already cut down to a considerable extent by the competition which has already arisen. At the same time, if you can do a better class of work than your rivals, you will succeed in spite of their number.

J. J.—The apparatus which we recently described for sketching by means of an optical lantern was purposely shown in a very elementary form. The arrangement which you suggest would certainly be more conveuient in every respect. But you will observe that it could not easily be made at home except by an expert with the turning lathe, like yourself.

THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1734.—*November* 27, 1891.

CONTENTS.



## GAS EXPLOSIONS.

When Carlyle tersely enumerated the population with the addendum that they were "mostly fools," he uttered a sentiment with which everyone agrees, fools and all; for that "a fool is wise in his own conceit" is as true to-day as it was in the time of David. Carlyle's bitter words are unconsciously called to mind when we read the story of a household gas explosion—a story which is told about once a week in the newspapers with very little variation. If ever it were justifiable to use the word "stereotyped," it is in this connection, for the description of one explosion would do for any of the others, so like are they in cause and effect. Indeed, if it were our province to report such disasters, we should make a point of keeping the following sentence at least in type: "Having procured a light to search for the escape, a violent explosion suddenly occurred." It is a grave reflection on the receptive power of the public in general, that they have not yet appreciated the fact that when a light is brought into contact with a mixture of gas and air an explosion is the natural result. But fortunately it is not part of our duty to descant upon the idiotcy of gas exploders, nor would it, perhaps, be quite kind to do so, for the folly generally brings its own punishment.

There is another class of gas explosion, however, which, fortunately, is not so often chronicled, but which is generally of a far more serious character. We mean explosions connected with lantern entertainments. Upon another page will be found an account of a terrible disaster which occurred last week at Ilkeston, and we regret that, up to the time of writing, nothing has transpired as to the cause of the accident. All we are told is that bags and weights were employed, but as to what those bags contained—and here, probably, lies the key to the whole matter—no one has as yet ventured an opinion.

Bags are not often employed now for the storage of gas, for the simple reason that the gas supplied in cylinders answers the same purpose, is far cheaper, and can be kept for an indefinite time without change or deterioration. But we are still in what may be called the transition period with regard to these things; that is to say, many lanternists possess bags which are good enough to last for some time longer, and they naturally hesitate to go to the expense of obtaining cylinders. Others are conservative in their ideas, and do not believe in such new-fangled things as cylinders and regulators; they say that there is nothing like a good bag for gas. "You see how much you have in hand, and you are far more comfortable in every way than when a cylinder is employed." So it happens that, from economy or some other reason, bags are, to a large extent, retained, although now and then an explosion occurs with their use.

For some years we have had the opportunity of hearing of disasters of this kind which never reach the dignity of print. Unless someone is killed or injured, as in the deplorable accident of last week, the matter is generally more or less hushed up. Like most other disagreeable things, only a small percentage of the occurrences are made public; but it would certainly be for the general good if some enquiry were made into every case of the kind, and we are certain that if this were done, it would be generally found that, like the household explosions already referred to, some child of Carlyle was at the bottom of the matter. Here is a case in point which came under our notice not very long ago. A gas bag suddenly exploded in an entertainment hall just at the commencement of proceedings. The operator was a thoroughly experienced and efficient man, and could not account for the disaster—which, happily, injured no one, and greatly benefited the local glazier—until he remembered that when he made the oxygen with which the bag was filled, he left it for a short time in charge of a youth. This lad was cross-examined, and told a tale which at once pointed out the cause of the catastrophe. He said that, seeing that the bag did not become full, he disconnected it with the retort, and attached it by a tube to the nearest gas bracket. In this way, the clever youth had prepared for his master a bomb-shell filled with mixed gases, which did not fail to go off when the right time came. It is evident that, under such circumstances, even when a "safety jet" is employed, an explosion is bound to occur.

The fault in the above case must not lie altogether at the door of the ignorant bungler who filled up the bag with the wrong gas, for the owner of the bag should not have left it in such hands. In only one case that we can remember was an explosion due to a cause not traceable to foolishness or carelessness. In this instance one bag was in use—in connection with a safety jet—and there was a sudden blow-up. The bag was filled with oxygen alone, of that there was no doubt; but being somewhat old, its interior had become filled with dust, and what really occurred was a dust explosion in an atmosphere of oxygen. If anyone will take the trouble to unscrew the tap from an oxygen bag which has been long in use, he will find that he is able to shake out from the hole a handful of light brown, silky dust. An ignorant operator once described this to us as "oxidised" oxygen, but it really consists of particles of the coarse canvas with which these bags are lined, and upon which the gas—owing, probably, to the chlorine which comes off with it from the retort when potassic chlorate is used—seems to exert a rotting action.

Bags are safe enough in careful hands, but unfortunately careful hands are not as common as they might be, or explosions would be next to impossible. With cylinders, no accident has yet been recorded in connection with any lantern show, although they have been known to explode while being tested, filled, or experimented with. In one case, the experimentalist went to work in such an utterly foolhardy manner that some persons have regarded the inevitable result as an act of suicide. While expressing our sympathy with the sufferers by the explosion at Ilkeston, we trust that the enquiry will be of such a searching description that no doubt will be left as to its primary cause.

## ON LIGHT AND DIRECT ENLARGEMENTS.*

BY CAPTAIN W. DE W. ABNEY, C.B., R.E., D.C.L., F.R.S., F.C.S.

I have recently come from indulging in a little climbing in the Alps of Switzerland. With the air of Switzerland still in the lungs, one is almost bound to look at any subject from the Alpine point of view. Taking this aspect of the question, I may say that, though a source of light may have been discussed from several aspects, there may be others from which it may be looked at. From the light of the glow-worm to that of the sun is a very long way to travel; part of it is like the grass slope and moraine which you have to traverse before you get to your peak, and so I propose to cut the first part of the journey short, and to commence where the real climb begins. Let us start from the common domestic dip, and take you by large jumps into the sunlight. Now to plunge—I might say dip—into the subject. We can take a negative by the light of a candle, or of the moon, but if we try and print by either of these sources we fail, and it may be worth while to enquire why this is. First of all, we have to measure the visual effect of the lights, and second, the photographic effects, and then make comparisons and deductions. The visual effect of sunlight may be measured in a variety of ways, though it is somewhat harder to do than it may appear. Measures recorded in text-books tell us that sunlight is equivalent to about 5,500 wax candles placed one foot off from a screen. It is quite evident that to endeavour to use a grease spot or shadow photometer in the ordinary way would be impossible. A way to circumvent this is to use a standard intermediate between the candle and the sun, and so a measure can be got. The intermediate light can be a steady burning electric arc light, which may be of, say, about 1,000 candles. In this case the sun should have the value of about 5½ electric lights at one foot off the screen. We may place it two feet off, and then the sun will be equal to about 11 such lights, and if rotating sectors be placed in the beam of sunlight, they would have to be closed to about 16° of aperture, when equalisation would take place. Again, sunlight may be reflected from a piece of plain glass, and the dimmed reflection cast upon the screen, and the electric light can be placed further off, when by similar means the lights may be equalised. By calculation or absolute measure, the amount of reflected can be compared with the incident light, and the intensity of the sunlight is soon arrived at. There is another plan by which the intensity of sunlight may be so diminished that it may be directly compared with a light from a candle. Suppose we have a small vertical mirror ¼-inch wide attached to the spindle of rotating apparatus, and so arranged that it rotates round a vertical axis; then, if a beam of sunlight be made to fall on this mirror when still, it will throw a thin beam of light back on to the screen in the same way that a beam of light is sent from the mirror of a reflecting galvanometer on to the scale. If now the mirror rotates, a band of light will traverse the screen, which will be much enfeebled. If the screen were 220 inches from the mirror, the latter being exactly ¼-inch broad, and if the sunlight were 5,500 times that of a candle at one foot off, the candle would have to be one foot off the screen to cast an equally illuminated shadow. The mirror might be diminished in width, when the sunlight would be balanced when the candle was further off. A better plan is to cause the beam of sunlight to fall on to the mirror through a slit which can be regulated and measured at pleasure, and balance the two lights in the ordinary manner, measuring the distance of the candle from the screen. I make sunlight at midday in June on a cloudless day to be about 5,300 standard candles by all three plans. Now, the term sunlight is, as a rule, used in a denominational sense rather than in a quantitative. In the Alps, at an altitude of 8,000 feet, you may fairly add half to this number, and sunlight will be about 8,000 standard candles at one foot off. But as we are about sea level, and in England, I must point out how it varies in intensity at different times of the day and at different times of the year:—

| | Candles. |
|---|---|
| If it were overhead it would be about ... ... | 5,600 |
| 30° above the horizon it is ... ... ... | 4,700 |
| 20° ,, ,, ,, ... ... ... | 3,300 |
| 10° ,, ,, ,, ... ... ... | 2,000 |
| 8° 30′ ,, ,, ,, ... ... ... | 1,400 |
| Just before sunset ... ... ... ... | 140 |

So in measuring sunlight, this fact must always be borne in mind.

*Abstract of a paper read at the Camera Club.

So much, then, for this light as appreciated by the eye; but what about its photographic value for negative making and printing? How can we measure it? Now, it happens that the curve of sensitiveness to the spectrum of a bromo-iodide plate and for platinum paper are almost identical.

First of all, however, we can directly compare the photographic value of sunlight with that of a candle in a simple manner. If we allow sunlight to pass through a very narrow slit in a shutter, reflecting it on to the slit by the heliostat (which, by the bye, I ought to have mentioned was used when ascertaining the optical value of the light), we can catch the beam on a plain glass and reflect it on to a screen. We can first measure the optical value of the beam against a candle, and then measure on a photographic plate the densities produced by it, and by a candle exposed for different times, and thus ascertain from this last scale its photographic value:—

| | Candles. |
|---|---|
| Overhead it would be ... ... ... ... | 120,000 |
| At 30° ... ... ... ... ... ... | 72,000 |
| At 20° ... ... ... ... ... ... | 42,000 |
| At 10° ... ... ... ... ... ... | 9,000 |
| At 8°30′ ... ... ... ... ... ... | 5,600 |
| At sunset ... ... ... ... about | 1.7 |

The photographic value, therefore, diminishes much more rapidly than the optical value, and when close to sunset it is almost nothing. It is not hard now to see why, at this altitude of the sun, photography—the effect of sunlight—is difficult of execution. Let us, however, take the sun at its best, and suppose we have a negative to print from in platinum: I have found that an exposure of 50 to 60 seconds is ample to make a print in direct sunlight. That is, the light of 120,000 candles, at one foot distance, will take, say, one minute to give a print. We may place a gas light (which is a slightly whiter light, and hence more photographically energetic, than a candle) of, say, 100 candles near the negative to print, and it would take 1,200 minutes, or 20 hours, to obtain a print by. If it were a 20-candle lamp it would take 100 hours, an exposure which is certainly somewhat long. As a matter of fact, I have obtained a *trace* of a print from a 20-candle gas lamp in about 12 hours.

Now a word about moonlight. I find that the photographic value of the light of the most brilliant full moon is about 400,000 times less than sunlight at midday in summer (it is usually put down at 500,000 times). It is therefore quite evident that to obtain a print (except by development) by moonlight is impracticable.

There are other lights to which we naturally turn in order to see what value they have, viz., the arc electric light, the oxy-hydrogen light, and the magnesium light. Now, I have made pretty exact measures of the visual and photographic value of these lights, but it is useless to put them down in what I may call bulk, since they vary so enormously. They are even worse than sunlight in this respect. What can be done is to state, for every candle-power as measured by the eye, the candle-power as measured by photography, taking the candle as a unit in both cases. With the electric light and oxy-hydrogen light, the same method of measurement was adopted to find this ratio as just described for sunlight, viz., the light was sent through a slit and reflected on to a screen. For the magnesium light, a rather different procedure was adopted. It was measured by means of the blackening of platinum paper, a scale of darkness being previously made by exposure to different intensities of light. As it was not required to measure the absolute values of the light, but only its relative value compared with the electric light, it became unnecessary to know the absolute intensities of the light forming the scale, but only their relative intensities. The scale was therefore made by a Spurge sensitometer exposed to sky light. A Nadar lamp was used for burning the magnesium powder, which was allowed to burn for a minute at a fixed distance from the platinum paper. Another portion of the same paper was then exposed to the electric light at the same distance and for the same time, and was then developed. The blackness was measured and compared with the scale of shades. This gave the relative photographic values of the light. In the case of the magnesium light, the weight of magnesium burnt was noted and found to be 124 grains, and with electric light the visual candle-power was measured and found to be 1,150 candles.

The relative value of the two lights, each burning for one minute, was found to be—

124 grains of magnesium light—43 on the empyric scale.
1,150 candles of electric light—181 on the empyric scale.
∴ 1 *candle* of the quality of the electric light = ·16 on the scale.
∴ 1 *grain* of magnesium = ·35 on the scale.
That is, 1 grain of magnesium = 2·16 electric light candles burning one minute.

Now, the electric light candle was found to be photographically equal to 10·7 standard candles. Therefore, 1 grain of magnesium burnt was photographically equal to an exposure of 23·1 standard candles burning one minute—of course, at the same distance.

One candle-power of the oxy-hydrogen light (a blow-through jet being used) was found to be equal to 1·7 standard candles, but for reasons I am inclined to increase that value to a little over 2 standard candles. A good blow-through jet may equal 400 candles optically, that is, 800 candles photographically. With this light it would then take five hours to obtain a print on platinum paper.

With magnesium, 1,150 electric light visual candles (that is, 12,300 photographic candles) equal $\frac{181}{43}$ of the magnesium light, each burning one minute, that is, electric light is four times the photographic value of the magnesium light. Now, 12,300 photographic candles at a foot off is about $\frac{1}{10}$ of sunlight. It should, therefore, take about ten minutes to obtain a platinum print from the negative described if placed one foot off, or forty minutes when burning, magnesium expending 124 grains a minute. That is, to obtain a print with magnesium, 4,960 grains, or rather less than 12 ounces, should be burnt one foot off the negative.

These considerations, then, show that practically sunlight and the arc electric light alone are available for printing purposes. Ordinary daylight has been excluded from consideration, as it is in another category of sources of light.

Now, if these two lights are so useful in contact printing, why should they not be used for printing-out purposes in an enlarging apparatus? As a matter of fact, both are useful, and it does not require an elaborate apparatus to use them for such a purpose. Sunlight is perhaps that which may often be most available to the members present; but I will first describe the arrangement which I use for the electric light. I have two condensing lenses of about 6 inches diameter and of about 6 inches focus, and these I place about 10½ inches apart from one another, convex side inwards. At 5½ inches from the front of the combination I place the electric light, placing between it and the lens a piece of plain glass, to protect the latter from the heat. In front of the other lens, and close to it, I place the quarter-plate negative which I may wish to enlarge, and at the focus of the combination is placed a lens of about 7½ inches focus in a whole-plate camera. The light is turned on, and an image of the negative is thrown on the screen and focussed. Platinum paper, or other paper, is placed on a carrier in the dark slide, and exposure made, and so long as the image of the points of the carbons fall within the area of the lens, the whole image will practically be equally illuminated. To enlarge from ¼ to 7½ by 5 size, practically the length of focus used was 18 inches, so that really, if the negative were removed, the image of the points being taken as a source of light, the paper was 20 inches from the screen, as the circle of light was the same. Now, as has already been said, it takes ten minutes to print a negative when placed 12 inches from the screen. To print this enlargement it should take twenty-eight minutes. As a matter of fact, the prints, except those taken on very thin negatives, took thirty-five minutes.

Now, the light I used was 1,150 candle-power. If one of 11,500 candles was used, the time of exposure would have been reduced to four or five minutes. With my light, had I wished to produce a print from the quarter-plate negative on to a piece of paper measuring 15 by 12, the exposure would have been 2¼ hours. With the larger light only about a quarter of an hour. There is absolutely no difficulty in producing prints by this plan. Even if the light changes in position slightly it still is effective, and causes no blurring in the image, as is often supposed to be the case.

With sunlight the same kind of apparatus can be used, but instead of two condensing lenses, one is sufficient, as the use of the two was only to shorten the focus, which would be long if only one were used with the electric light, seeing that it is placed so close to the condenser. With the sun, by using only one condenser, we get about the same length of focus as obtained with the electric light. The same camera and lens can be used, and the sun be reflected on to the condenser by an ordinary looking glass, taking care that it is flat, and does not give a streaky reflection. So long as the focus of the sun is kept on the camera lens, the image will appear equally illuminated. In this case, with a midday summer sun, the exposure should be the same as that to be given to the 11,500 candle-power electric light. Solar enlargements are, therefore, not only practicable, but tolerably easy to obtain when there is a good sun.

For quick enlargements the negatives should be stainless and, as far as possible, be perfectly bright. The image given by eikonogen developer seems particularly suited for them, as also hydrokinone. Pyro development is not quite so good. I have already shown that the density of the highest light in a negative need only be such that it will allow $\frac{1}{20}$ of that light to pass which passes through the most transparent part. I show a print from a negative in which the highest light is only $\frac{1}{15}$, and yet it gives a fair print.

There are other practical points which I wish to call attention to. First, if you have scratches in your condensing lens, beware of putting the negative too close to it. In one of the two prints of the front of Monte Rosa, you have an example of scratches in the lens at the bottom right-hand corner, and indeed the same scratches will be found in other prints. In the second one, however, the scratches are gone by removing the negative an inch away from its old position, in which the remainder of the prints were taken. Slight scratches on the film also show. These can be got rid of by coating the film with collodion, or by soaking the plate well in water.

There is one point to be remembered in all enlargements, and that is that the opacities of negatives, except, of course, in the transparent parts, are increased. That is, if the density be measured when the negative is far away from the screen, and when close to it, it will appear to have greater opacity in the former case than in the latter. This fact renders it possible to obtain an enlargement print from a negative which is superior to that in contact in the printing frame.

## COPYING WHITE AND BLACK SUBJECTS.

We abstract the following concise directions of photographing line engravings, &c., from a communication by Mr. P. C. Duchochois which recently appeared in the *Photographic Times*:—

As rightly said by Professor Klauser, *clichés* of line-subjects should be of a great opacity in the whites, and of a perfect clearness (bare glass) in the minutest lines and dots. And this is not as easily done as it seems; it requires a certain practice.

The first difficulty is the exposure time. When photographing half-tone subjects—portraits, landscapes, &c.—from nature, we should lengthen the period of exposure according to the lighting of the subject, in order—if the contrasts are photographically great, as is generally the case—to have the benefit of the reversal, or, in other words, to equalise, as far as it is possible, the action of weak and strong lights, and thus to avoid harshness or loss of details in the shadows, one entirely depending on the manner of conducting the development to obtain vigour and brilliancy after the delicate details are out and well defined.

On the contrary, to obtain the greatest opacity in the whites, which is a *sine quâ non* when photographing white and black, instead of lengthening the exposure time, we must expose as shortly as possible, to prevent *solarisation* (*i.e.*, the primary action of the reversal), and keep the blacks quite clear by not having been impressed—I will not say by the light reflected from the lines or dots, which, if the ink is lustreless and opaque-black, is impossible—but by the diffused light entering into the lens, it being sometimes reflected by extraneous objects. Hence, the lens should be provided with a top shade, or, better, with a cone lined with black velvet.

It is useless, is it not, to say that the lens should be placed outside of the field of the angle of incidence formed by the light falling on the model; that the latter should be exactly parallel to the lens; that it should be pinned on the bottom of a box having the form of a cone and lined with white cardboard, in order that, the light being upon it reflected from every side, the grain of the paper be not reproduced?

Now, as to the process. It is evident that for half-tone subjects none excels the gelatino-silver-bromide. But this is not in question. For white and black, I think, with most of the photo-engravers—and they are great authorities in this matter—that the wet collodion process gives the best results, and this with the least trouble and most certainty, provided the chemical preparations be appropriate to the process.

To compound the collodion, the best haloid salts are those of zinc; they form the most sensitive photo-film, and yield the greatest intensity. The drawback is that the collodion thickens somewhat, and does not keep. To turn the difficulty, I keep separately the plain collodion and the iodising solution, mixing them in certain quantities for a few days' use, thus:—

| | | |
|---|---|---|
| A.—Ether, 0·725 | ... ... ... | 240 fluid parts |
| Alcohol (Atwood's patent) | ... ... | 120 ,, |
| Pyroxiline | ... ... ... | 6 to 7 parts |
| B.—Alcohol, as above | ... ... ... | 120 fluid parts |
| Sodium iodide | ... ... ... | 3 parts |
| Zinc iodide | ... ... ... ... | 2 ,, |
| Zinc bromide | ... ... ... | 1 ,, |

Mix by equal volumes; filter through cotton.

Silver bath 10 : 100, acidified by nitric acid.

The developer should be acidified by tartaric acid.

| | | |
|---|---|---|
| Water | ... ... ... ... ... ... | 480 parts |
| Ferrous sulphate | ... ... ... ... ... | 25 ,, |
| Glucose (liquid) | ... ... ... ... ... | 15 ,, |
| Tartaric acid, | ... ... ... ... ... | 3 ,, |
| Acetic acid (No. 8) | ... ... ... ... | 15 ,, |
| Alcohol (ordinary) | ... ... ... ... | *quant. suff.* |

This bath keeps well in the light, acts slowly and regularly, and the image assumes much intensity. However, it seldom happens that the opacity is sufficient, specially for the want of the photo-typo-engraver. The *cliché* should be intensified. For that purpose we prefer —and this generally suffices—to convert the silver forming the image into sulphide by flowing it—when fixed and well washed, of course—with a diluted solution of ammonium-sulph-hydrate.

Other processes are employed: The old mercuric chloride and ammonia process of Scott Archer, the lead process of Dr. Eder, that of Wm. Campbell with cupric bromide and silver nitrate, &c., &c.; they are described in the Annuals. The only care to be taken is to commence with clear lines. Should there be any deposit of metallic silver, it ought to be dissolved by lengthened immersions in the fixing bath—a solution of potassium cyanide.

It is not very likely that the amateur photographer will ever attempt to work the collodion process. It requires great practice to keep the silver bath in good working order, to avoid pinholes, surface marking, &c.; to trace the failures to the real cause, &c. And the gelatine process is so simple; you buy the plates already prepared, you expose and develop. Yes, you expose and develop, and there again lies the difficulty. No doubt it can be done to perfection; Professor Klauser does it; others, amongst whom the writer of this paper, have done it, but often the lines are not exactly clear, and besides, the intensification is liable to spoil the *cliché* for the purpose in question.

We have used Carbutt's process plates, and sometimes those for transparencies; they are good and commendable. I think that Mr. Carbutt can still improve them. He has only to will it. There is no necessity, on the contrary, that they possess a great sensitiveness; if they are as sensitive as wet collodion plates that suffices—a little more iodide, less or more cooking.

To develop, I use pyrogallol; it is my favourite reagent, and I do not use any other one. I proceed thus; I immerse the plate in a sufficient quantity of—

| | | |
|---|---|---|
| Water | ... ... ... ... ... | 480 parts |
| Sodium sulphite | ... ... ... ... | 25 ,, |
| Pyrogallol | ... ... ... ... ... | 3 ,, |
| Potassium bromide | ... ... ... | 0·5 part |

In this I let the film soak for a minute, then I add about one per cent. of a saturated solution of sodium carbonate C. P. (not the commercial article sold under the name of *washing soda*, which is quite impure and liable to produce yellow fog), and wait to see the result. If the exposure time has not been too lengthened, the image will not commence to appear in a minute; we add, consequently, more—not much—of the carbonate solution, and then another dose if the image still refuses to make its appearance, taking care not to add an excess of alkali in order to prevent the secondary action of the same.

Should the image appear rapidly, one restrains the action by adding a few drops of a potassium bromide solution (1 in 10) to keep the blacks clear, a *sine quâ non*, as said before. As soon as the image appears and develops regularly, the action should be allowed to proceed until the reduction reaches the back of the film, when, all the impressed silver bromide being reduced, it is useless (nay, prejudicial) to leave the film any longer in contact with the developer. Long development produces a chemical veil as well as a physical yellow fog (dyeing).

After development the plate is rinsed, immersed for (say) two minutes in a solution of tartaric acid to avoid the yellow and sometimes green fog arising in the fixing bath, then washed, fixed, &c.

Now, as to the intensification. If the image bleached with mercuric chloride, then treated, after a prolonged washing by aqueous ammonia, or, better, by silver sodium thiosulphate—a solution of sodium thiosulphate (hyposulphite) *nearly saturated* with silver carbonate or chloride —does not acquire the necessary intensity from the silver reduction forming the image not being sufficiently dense, there are five chances to one that, by re-intensifying, the *cliché* will be unfit for photo-engraving purposes.

In concluding, I must say that, whatever be the process employed, halation is a common defect. Backing with an opaque material is the well known remedy.

Mr. Charles Ehrmann, in the same journal, writes as follows concerning the development of negatives for black and white work:—

With gelatine plates, the time of exposure is more important than with collodion. Collodion requires under-exposure because of the subsequent intensification; with gelatine plates it must be just so; and that is exactly the difficulty of the method. Expose for the whites; the blacks and the light reflected from the blacks should not cause the slightest impression.

Of developers for black and white negatives, I have found old hydrochinon solution to be about as good as any other, on account of the good intensity attainable. Eikonogen has not given me as good results as pyro, and that is most successfully used in freshly-prepared solution; but with either of them we encounter the main difficulty occurring with all the usual organic agents, yellowing of the film, caused by the oxidation products of the developer. For that reason, many operatives prefer to develop with ferrous oxalate. Wilde, of Görlitz, adds iodine dissolved in alcohol to the ferrous oxalate, and reports very satisfactory results. Seed used iodine and bromide of potassium with pyro-soda, and the negatives so developed were very encouraging.

Were I better acquainted with the new developing agent, para-amidophenol, I might take occasion to break a lance for it here. Anyway, can I say the experiments made with it are very promising for black and white work? If intensity is to be attained by long-continued development, no better substance than it can be possibly found. Tinging the plate yellow is entirely abolished with para-amidophenol.

To make black and white negatives on gelatine plates for the autotype process is, on account of comparatively lower intensity, perhaps not quite as difficult as for line-work photo-engraving. In consequence of developing not being extended quite so far, the plate is less liable to fog. With para-amidophenol we can develop as slowly as we may please without injuring transparency to the slightest degree.

Gelatine plates for process work should be intense enough in the first instance, without being compelled to resort to after-intensification; but, if it must be done, do it with cyanide of mercury and silver—it retains transparency better than others.

The constant improvements going on induce one to believe the time is not very far distant when the last stronghold of collodion, the process plate, will surrender to its ever successful competitor gelatine, but at the present time collodion still reigns in that province.

## EXPERIMENTS RELATING TO IMPROVEMENTS IN THE MANUFACTURE OF METALLIC SODIUM.

BY H. N. WARREN, RESEARCH ANALYST.

In the general process for the manufacture of metallic sodium, one of the greatest drawbacks at the present time is the difficulty of expelling the sodium as quickly as reduced in the form of vapour, insomuch that, for a considerable time after, a most intense heat has been obtained. On viewing the inside of the converters, large globules of melted sodium are not unfrequently observed, which are only with difficulty volatilised. Potassium, on the other hand, although presenting more difficulties than sodium as regards its preparation, melts and volatilises at a much lower temperature. For instance, if twenty-three parts by weight of sodium be carefully alloyed with twenty-nine parts of potassium, a fluid amalgam is produced which remains liquid at all ordinary temperatures; if this amalgam is now distilled in a non-oxidising atmosphere, in the first place potassium metal distils over, leaving a residue consisting of sodium containing about five or six per cent. of potassium. This alloy, which resembles ordinary sodium in appearance, is much more energetic than that substance itself, taking fire when thrown upon the surface of water the same as potassium, but burning with the characteristic yellow flame of the former.

Following up these reactions, several mixtures were obtained for reduction by calcining sodium tartrate in admixture with a sufficiency of potassium tartrate to allow of about five or six per cent. of potassium to pass into the distillate; the reaction being brought about in wrought-iron tubes, and urged to whiteness by the aid of a small blast furnace. The globules of metal thus obtained presented in appearance an exact similitude with the first-mentioned alloy, and were considerably more volatile than pure sodium. The iron tubes after cooling were cut longitudinally, and in no instance could any reduced metal be detected; the metals as fast as reduced having been volatilised, producing the aforesaid alloy.

The calcining of tartrates on a large scale would naturally be entirely out of place; but the introduction of potassium could, as far as can be seen, be brought into play when employing any of the ordinary commercial methods, save that the percentage of the two would probably have to be looked into still closer in order to obtain concordant results.—*Chemical News.*

## THE RODINAL DEVELOPER.

BY HERMANN E. GUNTHER.

Paramidophenol, an excellent reducing agent, is now commercially produced on a large scale, according to the process patented to Dr. M. Andresen, by the "Actien-gesellschaft für Anilin-Fabrication," of Berlin. It is sold by this manufactory in the form of a concentrated, ready-prepared solution, one part of which requires only to be diluted with thirty parts of water before use. To this stock solution the name of "Rodinal" has been given by its manufacturers.

From the excellent results this new developer has given in the hands of a large number of eminent professional photographers and amateurs, it may already be stated that the rodinal developer possesses very marked advantages, and that for some special purposes it is superior to all other reducing agents yet known.

As to its energy, I have found that it requires about the same time for developing out as in the case of eikongen; the image comes out, however, very rapidly after the solution has been poured on the plate. A gelatine plate exposed for one-tenth of a second was placed in a fresh solution prepared of one part of the stock solution and twenty-five parts of water; the image appeared in ten seconds, and a very vigorous and richly detailed negative was developed in about two minutes. If the stock solution is diluted with more than thirty parts of water, it works, of course, a little more slow, but the resulting negatives are of great softness, showing a beautifully bluish-black colour similar to those developed with hydroquinone. Potassium bromide may be added or an old developing solution employed in the case of over-exposure. Fixing is done as usual, preferably in the acid fixing bath.

Other operators have found—and I can confirm it—that the rodinal developer works absolutely clear, even after a very prolonged action, as, for instance, in the case of under-exposed plates. C. Kinderman states that the negatives should be developed to deneness, since they will reduce considerably in the fixing bath. The solution should have a temperature of about 68° F.

As I have already mentioned in these pages, the rodinal developer is especially well suited for prints on bromide paper. According to Dr. Stolze, it gives prints of unsurpassed clearness of the whites and velvety-black shadows, together with perfect softness of the half-tones. Since that time, Dr. Stolze has found that this developer gives also excellent results in the case of under-exposure, if to one hundred parts of it five parts of a solution of potassium bromide (1 : 10) are added. He observes that it is especially remarkable that the developer bears so large a quantity of the restrainer without injuring the tone of the print, which is always of a beautiful black.

It may be mentioned that Dr. Th. Schuchardt, of Görlitz, also produces the hydrochloric paramidophenol in his chemical works. It has the form of beautifully-shining white crystals; and if used in this form, a very good developer may be prepared in the following way:—

| | |
|---|---|
| Hydrochloric paramidophenol ... | 1 gramme |
| Sodium sulphite ... ... ... | 4 grammes |
| Caustic soda ... ... ... ... | 3 ,, |
| Water... ... ... ... ... | 400 c.c. |

In this form of a one-solution developer, it will not, however, keep clear for long; it will therefore be better to prepare it in two separate solutions, as follows:—

| | | |
|---|---|---|
| A.—Hydrochloric paramidophenol | ... | 1 gramme |
| Sodium sulphite | ... | 4 grammes |
| Water... | ... | 100 c.c. |
| B.—Sodium sulphite | ... | 4 grammes |
| Caustic soda ... | ... | 3 ,, |
| Water... | ... | 100 c.c. |

In the case of instantaneous exposures, equal parts of solutions A and B are mixed; whilst for time exposures this mixture should be diluted from two to three times its bulk of water.

## REVERSAL.*

BY HENRY SUTTON.

In opening the subject of reversal, it would be well to understand that a reversal negative and a reversed negative are different things, a reversal negative being the result of what has been termed reversing action; it is produced direct from a negative, and is reversed as regards right and left. A reversed negative is reversed as regards right and left, but is produced from a positive.

We all know that over-exposure produces flatness, owing to the difficulty of obtaining density in the high-lights; it is easy to conceive an exposure sufficiently prolonged as to cause an entire loss of the high-lights. If in such an exposure the shadows have not received sufficient light to produce a strongly developable image, the result on fixing would be an extreme case of over-exposure, as understood by a thin image; but if during development stray light obtains access to the plate, the shadows fog, and we have reversal.

The original high-lights, as we shall see, are both undevelopable and insensitive, therefore do not fog. We may produce this fog by preliminary, concurrent, or supplemental exposure; in all my experiments it is deliberately produced in order to supply the necessary reduction to those parts of the plate not rendered undevelopable by oxidation. In a reversal exposure this oxidation is regulated by the interposed negative or positive; therefore, when we fog or expose the still sensitive portions of the plate, a reduced image is formed capable of being developed.

In our experiments, the reduction will be produced by concurrent exposure; that is, while we are oxidising through the shadows of the interposed negative, we are fogging or reducing through the high-lights with stray light. In order to illustrate this matter, I will expose a plate to magnesium light a sufficient time to enable oxidation to produce the undevelopable and insensitive state; another plate will be taken, and the pair exposed in contact with a negative. I think we shall find one plate give a reversal, and the other show it is really undevelopable and insensitive. The insensitive or oxidised plate will show the state of the shadows in the reversal plate, this latter having a gradation of oxidation and the rest of the plate fogged. The insensitiveness may be only comparative, for, though the plate has still the power of producing a print-out image, I have not succeeded in producing a second developed reversal from it. Captain Abney has shown that the undevelopable state is due to oxidation.

Although it is possible to produce an exact reversal, I do not think these physical reversals are of much practical account, from the fact that a very exact balance in the two factors of reduction and oxidation is necessary; if the latter be in the least overdone, the delicate tones are oxidised out of existence, or, if the reduction has been too much, delicate tones are fogged and disappear; under these conditions the gradations are quite false. In some cases reversal improves the result; subjects having too many tones may have the middle tones obliterated. Hard negatives are reproduced perfectly.

When making experiments of this kind, the natural conclusion one arrives at is, that dark flashes seen on photographs of lightning are the result of reversal. The light from one grain of burning magnesium is sufficient to produce reversal. So we may consider a lightning flash having a similar actinic or photographic value should do the same. This value may be due to a discharge of exceptional duration, or to a brilliant flash caused by a maximum electromotive force with a minimum quantity of matter in the path of the flash.

One evening I was observing a display of electric discharges in a large cloud situated on the northern horizon; these discharges were accompanied by sympathetic discharges in a cloud on the southern horizon. The northern cloud was approaching, and I concluded that, should the clouds be at different altitudes, a difference of air currents might enable the one to overtake the other. A more rapid movement of the northern cloud was soon noticed; a camera was fixed up and carefully focussed on the southern cloud, by aid of the local discharges. All being in readiness, and the shutter of slide drawn, but cap still on the lens, I waited events. When the northern cloud reached the zenith it began to show considerable symptoms of electric excitement at the edges; knowing this to be my opportunity, the lens was uncapped, and in about half a minute a pair of brilliant flashes darted from the zenith to the southern cloud. I estimated the duration at over one second.

The plate was immediately developed, but not a sign of the flashes. I expected to find a pair of curly black streaks right across the plate; instead, there appeared a very fair cloud negative, and the black outlines of some buildings low down in the field; these buildings enabled me to verify the position of the camera, which, being attended to, proved the field must have included the flashes. I could never account for getting the clouds and not the flashes, until the matter came to mind whilst making the reversal experiments, and now think the exposure reached the transition stage described in Experiment 14 of my paper in the Club *Journal* for September.

There may be points which, with our present limited knowledge of the dark flash, seem difficult to reconcile; still, I think we are pretty safe in accepting reversal as the cause.

* Abstract of a paper read at the Camera Club.

To Milkmen and Others.—Beware of the hand-camera. If London roguery were systematically organised, some such notice as this might be looked for as a result of the disclosures made by Mr. Hepworth, the president of the Holborn Camera Club, at his interesting magic lantern demonstration. Among the "London Street Scenes," which formed a large proportion of the slides, was one entitled "Caught in the Act." It projected on the white background a figure of a man standing on a water-cart pouring water into a large milk can, while hard by was a cow standing at ease. The little scene was so full of expression, as the art critics say, that Mr. Hepworth tells us it had been supposed that he had arranged the composition, or, as photographers put it, "posed the subject." This, however, he assured his audience was not the case. He had simply come upon it accidentally when he was in quest of street scenes with a hand-camera, with which he secured an instantaneous record of this milkman's method of doing business.—*Daily News.*

## Notes.

We understand that a company has been formed to work the photo-mechanical process, by Mr. Sutton, which was fully described in these pages some months ago. The process is now brought out under the name of electro-phototypy; and, according to the promoters, they expect that it will revolutionise illustrated literature, on account of the excellent results obtained by it, its rapidity, and its cheapness. Patents have been granted for this process in all European countries, as well as in Australia, the United States, Canada, India, &c. The circular sent to us with reference to this company contains several illustrations printed on finely surfaced paper. We hope shortly to place before our readers an example of this method of illustration, and then they will be able to judge for themselves how far it is likely to rival the various processes at present in use.

In the handsome monthly review, *Paris-Photographe*, appears an article by a well-known physiologist on photography of speech, with a very curious illustration. This consists of twenty-four little pictures half the size of a postage stamp, giving the phases of movements of the lips in pronouncing the phrase "*Je vous aime.*" The pictures certainly do not convey much information without the explanatory words, and in looking at them one cannot help wondering whether the deaf and dumb who are taught on the lip movement principle would understand this silent photographic language. Perhaps in time, when schoolboards have left off squabbling among themselves, and have time to attend to the teaching requirements of the age, we shall all get educated enough to understand this quaint form of caligraphy. Then the ardent lover will send photographs of the sweet words he would whisper to the absent one, and the irate parent will be able to photograph all the horrible words he wishes to employ for the benefit of an unsuitable suitor for his daughter's hand. It is well-known that the late J. B. Buckstone—who was as deaf as a post—used to read the lip movements of the actors with whom he was playing. The pictures of such movements point to many strange possibilities.

A correspondent, referring to a number of old gelatine plates which have come into his possession, asks us a question which has often been asked before: What is the life of an unexposed gelatine plate? The answer is not an easy one, for, according to our experience, some of the best plates in the market are good for very little when a few months old, while others seem to keep almost indefinitely, provided they be intelligently packed. We have heard of wonderful results being obtained on very old plates, and of certain workers who regard them like old wine—the more ancient the better. We are not of this opinion ourselves, and view with the eye of suspicion any packet which remains unopened for a few months. Certainly we should never dream of using such plates for any important work, and should look upon such action as the height of false economy.

Dr. Vogel has recently called attention to a system of enlarging photographs which has been known for some time, but has been very little practised; and, truth to tell, other methods are far more certain and reliable. The plate is soaked in a weak solution of fluoric acid, until the film separates from the glass. It is then thoroughly washed in water, when it will swell considerably larger than it was originally. We fancy that only certain plates are amenable to this treatment, and possibly, too, some developers would have the effect of rendering the gelatine non-absorbent. The game, in any case, is hardly worth the proverbial candle.

What a shudder must go through an artist when, after parting with a picture, copyright included, he sees coloured photographs of it hanging in the print dealers' windows. "The Health of the Bride" of Mr. Stanhope Forbes is just now very popular, and coloured photogravures are being turned out in quantities. We do not say this coloured work is not skilfully done; but the crudity of the tints as compared with the harmony of the original is very marked.

A short time ago a story was told of a Yankee theatrical manager, who had the crowd of commissionaires and messengers thronging the box-office to engage seats for their employers, photographed. The photograph was procured, and multiplied copies of "The Rush for Seats" appeared in shop-windows and on the prominent hoardings, and the advertisement at once told. We do not see why this notion should not be improved upon. A photograph by flash-light could be easily taken of the entire audience, showing the effect the play had upon their countenances. If it were a farcical comedy, the laughing faces would tell their own story; if a moving tragedy were being enacted, the pocket-handkerchiefs of the ladies might be emphatic evidence of the pathos of the scene. It is a pity that the sniffs and coughs of the male portion of the audience, who usually confide their emotions to their opera glasses, cannot be photographed; but here the phonograph would come in handy, and the two would certainly prove unmistakably the success of the play. Perhaps, to be on the safe side, it would be well to leave the photographic operation until after the first night.

It is claimed by a non-photographic contemporary that ballooning "has been of use in enabling photographs to be taken of parts of the country which could not be taken by other means." Of course not. How could balloon photographs be taken save by means of a balloon? We have not yet got to flying machines. If Mars, Venus, or the moon possess photographers, their photographs of the earth have not yet reached us. Still, one is grateful for the information afforded by the—in mercy we will withhold the name of the paper.

Mr. Littledale's paper on "The Pamirs," read on Monday before the Geographical Society, was of unusual interest to photographers. Mr. Littledale is himself an amateur of no mean skill, and his collection of photographs exhibited at the close of the lecture was the subject of much interest. Apart from this, however, Mr. Littledale demonstrated how unexpectedly useful a camera may become in cases of emergency. In the course of his journey he learnt that his Chinese guide, who was leaving him, had in his mind a scheme for plundering the caravan. Mr. Littledale at once took a bold course. He simply told the man he had taken his photograph, and threatened to send it to the Chinese Governor of Kashgar with a request that the original of the portrait, if anything happened to the caravan, might be crucified and disembowelled. The salutary effect was instantaneous, for the would-be thief immediately abandoned his design.

## PHOTOGRAPHY FROM A DISTANCE.

We have abstracted the following from an article in our German contemporary, *Prometheus*:—

In the choice of material which it brings before its readers, *Prometheus* has always held fast, as its first principle, the desire to bring forward only such novelties as it has already proved in a practical manner, but if we to-day depart, for once, a very little from our customary usage, it is because the new aid to photography of which we have to report has produced very practical proofs of its capabilities; so far only experimentally, but not the least doubt exists of what it is able to perform.

The new aid to photography permits the direct enlarged photographing of distant objects, presenting them about the same as they appear to us through a hand telescope; and this is done by means of apparatus which is no more cumbersome, no larger, and no costlier than an ordinary tourist camera with an aplanatic lens. With the ordinary photographic lens, we can easily figure to ourselves the sizes of pictures of distant objects which the lens affords, if we consider that the original is in the same proportion to its picture in the enlargement as its distance from the camera is to the focal distance of the lens. An example will explain this.

Given a man of 2 m. height walking at 100 m. distance from the camera, our lens having 0·2 m. focal distance, then the picture will be only 4 mm. high, therefore showing scarcely the outline of the figure, and not the least detail. Or suppose we photograph, with a larger camera, with a lens of $\frac{3}{4}$ m. focal distance (such a lens is decidedly cumbrous), a fortification which is 10 m. high and 150 m. long, at a distance of ten kilometres, our picture will turn out only 0·75 mm. high and 11 mm. long, consequently representing a simple horizontal stroke without detail. The only means which we have hitherto possessed of enlarging the dimensions of pictures consisted in approaching the object more nearly, or using a longer focus lens; where the first was impossible, the latter availed little. This great want in photography, for many purposes, has long been actively felt, and several have already sought to bring powerful means to their aid. Thus, English and French amateurs have made use of a terrestrial telescope with which to photograph. This is accomplished by means of a special supporting instrument fastened on to the front of the camera, and the photograph is taken, well or ill, as the case may be.

The fact that hitherto nothing came of this idea needs no intimation; even those telescopic photographs which have appeared here and there as supplements to photographic journals appear to be forgeries. Photographs taken with lenses of exceptionally long focal distance have yielded much more perfect results; the astronomical photogram, whose perfections have caused a real revolution in our astronomical ideas, have originated in lenses of from 5 to 10 m. focal length. But any instrument, in order to be practically useful, must combine the following properties: small dimensions, great focal length, free choice of the size of the picture without altering the position of the lens, and, as much as possible, sufficiency of light.

All these advantages are possessed by a new and exceedingly simple lens, for which Dr. Adolphe Miethe has lately taken out a patent. The exterior is distinguished from that of an ordinary aplanat only by an arrangement which permits of changing the distance between the two lenses inside it within certain limits. The optical part consists principally of a convex lens of moderately long focal distance, and a concave lens of short focal distance. The space between the two lenses is about the difference in their focal distances. According to well-known optical principles, it follows that such a system will delineate converse, but exact pictures of objects that are the other side of, and at a great distance from, the convex lens. The size of these pictures varies, on the one hand, with the distance the two lenses stand apart from one another, and becomes greater as they approach one another; on the other hand, it is dependent on the proportion of the focal distances of the two lenses. The more difference between the focal distances, the greater (under otherwise ordinary circumstances) the picture will be.

Suppose that the focal distances are in the proportion of twenty-five to one, then this system will produce pictures twenty-five times as large as those produced by an ordinary camera at the same distance.

We do not propose to enter into the theory of the working of such an instrument. The whole apparatus resembles in principle a Gallilœan telescope, except that in this case we accomplish the formation of a real picture, and the making use of comparatively large fields of vision. Every reader who is in possession of an opera-glass and a camera can obtain an idea of the operation of this system. He must screw off the lens of the latter, and fasten one tube of the opera-glass in front of the opening in such a manner that the junction may be light-tight. He must then rack out the opera-glass to its greatest limit, and also the camera, and direct the whole upon some distant but well-lighted object. By screwing the opera-glasses up and down, he can easily produce a picture which will appear very large, and, in the middle at least, tolerably clear.

The extent of the application of the new lens will apparently be a very wide one. It will first of all be useful where a close approach to the object to be photographed is, for some reason, impossible. Thus, for example, in time of war, in the art of besieging; on explorations, surveying expeditions, and topographical photography; for detailed elevations of buildings, façades, memorials, &c. Armed with this camera, we shall be able to photograph the shyest wild animal, the circling eagle, or the torpedo boat on the horizon. We shall also be able to take life-sized portraits in a limited space, and with it we shall be able to dispense with lenses of from 2 to 3 m. focal distance, which, till lately, have been in use for this kind of work.

As the old blunderbuss stands to the modern rifle, so will the old camera lens stand to the space-governing power of the new one. But the new instrument will serve another purpose. We are already afflicted with innumerable hand-cameras, for no well-known personage can pass down our principal streets without being photographed a dozen times; in the future the situation will become almost insupportable. If we happen to go to any public park, a malicious being may post himself on some point of vantage, and seize our portrait, cabinet size; or, if we only happen to look out of the window, our portraits may be taken by the unseen camera at a distance, though we may find a slender protection in the shape of the smoke and fogs of great cities. In country and seaside places, distance will henceforth be no hindrance to photography.

[Our readers will note that the above article is an extension of our own leading article of the 16th of October on Mr. T. R. Dallmeyer's new lens. It is gratifying that one of our own leading opticians was the first in the field, Mr. Dallmeyer having obtained provisional protection for his patent on the 2nd of October. Dr. Miethe has acknowledged, in the pages of a contemporary, that his application for a patent in Germany was considerably subsequent to Mr. Dallmeyer's application in this country, and also that the publication of Mr. Dallmeyer's invention, that was referred to by us and two other English journals on the 16th of October, was the *cause* of his applying for patent rights in Germany. Dr. Miethe, in acknowledging this, stated that he had been for some time independently occupied with the same subject. Mr. Dallmeyer has spontaneously admitted this in the following words:—"Without the faintest reserve, I gladly accept Dr. Miethe's statement that the same subject has occupied his independent attention, but he must allow that his publication as well as application is subsequent to mine."—Ed.]

## AN ORTHOCHROMATIC COLLODIO-BROMIDE EMULSION.

BY DR. A. JONAS.

The following solutions are prepared:—

| | |
|---|---|
| I.—Crystallised erythrosin ... ... | 4 grammes |
| Distilled water ... ... ... | 50 c.c. |
| Alcohol (96 per cent.) ... ... | 450 ,, |
| II.—Silver nitrate ... ... ... | 3·4 grammes |
| Distilled water ... ... ... | 50 c.c. |
| Alcohol (96 per cent.) ... ... | 150 ,, |

Add ammonia solution until the brown precipitate formed is re-dissolved.

| | |
|---|---|
| III.—Picric acid ... ... ... ... | 3 grammes |
| Distilled water ... ... ... | 10 c.c. |
| Ammonia, sufficient quantity to neutralise | |
| Alcohol (96 per cent.) to make solution to 300 c.c. | |

For use, mix—

| | |
|---|---|
| Solution I. ... ... ... ... | 75 c.c. |
| Solution II. ... ... ... ... | 30 ,, |
| Solution III. ... ... ... ... | 20 ,, |
| Chemically pure glycerine ... ... | 25 ,, |
| Alcohol (96 per cent.) ... ... | 120 ,, |
| Distilled water ... ... ... | 20 ,, |

Allow this cloudy solution to stand for a quarter of an hour, and then add, drop by drop, with constant agitation, stronger ammonia until the mixture is perfectly clear. The solution should now be allowed to stand one or two days in a well-corked bottle, and then filtered. Add 10 c.cm. of this preparation to 100 c.cm. of raw emulsion. By violent agitation the colouring matter is evenly distributed, and after filtering twice through cotton, the coloured emulsion can be at once employed. The coloured emulsion will keep only one or two days, and is best prepared each day just before use.

The raw emulsion should always be well shaken for two to four minutes before mixing, in order that the bromide of silver, which, when the emulsion is at rest, sinks to the bottom, may again be evenly distributed.

The emulsion stained with eosin gives harmonious, soft negatives. The erythrosin emulsion works rather harder, and is especially useful when somewhat hard and strongly contrasted negatives are wanted.

The exposure required is about one-third that with the ordinary wet-plate process, and for the reproduction of paintings no yellow screen is needed.

The eosin and erythrosin-silver solutions keep indefinitely, and should be kept in the dark.

The following directions for the further operations, given by Dr. E. Albert for his emulsions, have been found equally serviceable for my eosin and erythrosin emulsions.

The glass plates used for collodion emulsions should be given a preliminary coating prepared as follows:—Dissolve 5 grammes of gelatine in 50 c.cm. of water, and add 15 c.cm. of acetic acid and 10 c.cm. of alcohol. The solution is filtered warm (30° to 35° R.), and whilst warm is flowed twice over the plates; the latter being removed from the acid and thoroughly rinsed. After being coated, the plates are placed in a vertical position and dried in a room free from dust, at a temperature of at least 15° R.

If stripping plates are needed, it is best to use new glass. The latter is first vigorously rubbed with nitric acid (by means of a flat piece of wood), washed and dried, and afterwards carefully rubbed with chalk, ammonia, and an alcoholic solution of iodine; then dusted with talc, spread evenly without pressure with a tuft of clean cotton, the talc being removed completely with another clean tuft. After this the plate can be coated with emulsion as usual.

The emulsion is flowed over the plate exactly as the iodised collodion in the wet process—in a red light. This can be obtained with an ordinary red dark room lantern, placed about on a level with the operator's head, and distant about one meter—the light coming from above greatly facilitates the preparation of the plate. The light may also be obtained by means of an ordinary dark room window, such as is used for highly sensitive gelatine plates.

Fog and insufficient strength in the pictures come principally from too bright illumination, since both the uncoloured and the coloured emulsions work without fog.

As soon as the collodion is set, the plate may be inserted in the holder, and at once exposed; it will keep moist, however, in a not too warm room thirty to forty minutes. After exposure the plate is washed (in red light) until it no longer shows the so-called greasy streaks. It is held vertically to allow the water to drip off, and is then flowed with the developer. As soon as the developer is on the plate and the image begins to appear, the plate can be examined by weak yellow light. If the development has been carried far enough, the plate is again washed, and then fixed. The fixing takes place rapidly, as well as the elimination of the hyposulphite of soda.

It may here be remarked that the washing should be under a stream of water, which should be moved back and forth over the plate, that it may be covered with water evenly and quickly. The larger the plate, the longer it must drain, and if it has not drained sufficiently the negative is streaked.

The developer should be flowed abundantly over the plate in the same manner as ferrous oxalate in the wet process:—

*Concentrated Hydrochinon Developer.*

| | |
|---|---|
| A.—Distilled water ... ... ... | 500 grammes |
| Sul. soda ... ... ... ... | 200 ,, |
| Carb. pot. ... ... ... ... | 200 ,, |
| B.—Hydrochinon ... ... ... ... | 25 grammes |
| Alcohol (96 per cent.) ... ... | 100 ,, |
| C.—Brom. amm ... ... ... ... | 25 grammes |
| Distilled water ... ... ... | 100 c.cm. |

Developer compounded as follows:—

| | |
|---|---|
| A ... ... ... ... ... | 100 c.cm. |
| B ... ... ... ... ... | 7 ,, |
| C ... ... ... ... ... | 7 ,, |

For negatives of a hard character, the proportions of B are increased to 6 to 10 c.cm. An increase of solution C produces greater clearness, but decreases the sensitiveness somewhat. Hydrochinon increases the strength, bromide of ammonium the clearness, and carbonate of potash accelerates the development.

For developing, a mixture is made of 150 c.cm. of concentrated developer to 1,000 c.cm. of water. By the addition of more concentrated developer, or dilution with more water, a result may be obtained which gives a very fair negative, according to the character of the original. The same rule holds in regard to the addition of more or less of the hydrochinon or bromide of ammonium. For the developer only the best and purest carbonate of potash must be used.

The plate can be intensified before fixing with pyrogallic acid exactly as with the wet process:—

| | | |
|---|---|---|
| A.—Pyro | ... | 7 grammes |
| Citric acid | ... | 7 ,, |

are dissolved in 150 c.cm. distilled water, and twenty-five drops acetic acid added.

| | | |
|---|---|---|
| B.—Nitrate of silver | ... | 10 grammes |
| Distilled water | ... | 100 c.cm. |

Just before using, mix 100 c.cm. A with 5 c.cm. B, and intensify until the desired strength is reached. Negatives intensified in this manner dry still stronger.

*Intensifying after Fixing.*—For intensifying after fixing, the ordinary pyro-silver intensifier, as well as that given by Capt. A. V. Hübl, hydrochinon-silver intensifier, may be used:—

| | | |
|---|---|---|
| I.—Hydrochinon | ... | 10 grammes |
| Distilled water | ... | 1,000 c.cm. |
| Citric acid | ... | 5 grammes |
| II.—Nitrate of silver | ... | 10 grammes |
| Distilled water | ... | 300 c.cm. |

Just before using, mix 3 parts of I. with 1 part of II., and flow the fixed and well washed plate while still wet; as soon as the required degree of intensity has been reached, wash and allow to dry. In order to obtain greater intensity, the negative can be intensified with a solution of two parts of chloride of mercury, 2 parts of bromide of potash, and 80 to 100 parts of water; afterward blackening with sulphite of soda solution (1 : 6).

For reducing, the method used for gelatine plates—hyposulphite of soda and red prussiate of potash—works well. —Abstracted from *Photo. Nachrichten.*

## THE PHOTOGRAPHIC REPRODUCTION OF OLD MSS.

BY J. F. SACHSE.

Of late years, the photographic reproduction of important manuscript documents has become an important branch of our art. As these, in many cases, are illegible and sometimes entirely faded—through dampness or by the use of unstable inks—the photographer is often at a loss how to proceed so as to make a satisfactory reproduction. To overcome this difficulty, a German contemporary suggests to slightly damp the faded manuscript, then paint the writing over with sulphide of ammonia (*schwefelworserstoff-ammonia*), when the writing will immediately come out black and legible. If the document is parchment, the restoration is permanent; if paper, the result is similar, but the effect is only transient. The above action is easily explained by the formation of sulphide of iron.

So far, so good; granting that a satisfactory negative results, what is the effect upon the original? No valuable document should be entrusted to an unreliable photographer, or one who would imperil the original by chemical manipulations. All such risks should be avoided, as the desired result can in almost all cases be achieved by purely photographic means.

We have had a large experience in this particular branch of photography, and always avoid anything which, even in the most remote degree, might work a permanent injury to the original.

In copying subjects of this kind, a slow plate, short exposure, and development with ferrous oxalate, will usually bring about the desired result. In difficult cases an eikonogen developer is often of service.

When the MSS. is very much faded or discoloured, and all other methods fail, the following has given excellent results. Develop with a combined eikonogen and hydrochinone developer until the detail is well out, then fix in acid fixing bath, wash well, and when thoroughly dry, bleach out with the usual bi-chloride mercury and sal-ammoniac solution, wash in running water for fifteen minutes, and when dry place in front of a dead black surface, and photograph. The resulting negative can then be, if necessary, intensified. Excellent results have been obtained by this method; the greatest advantage of all being that it works no possible injury to the original. —*American Journal of Photography.*

## FATAL GAS EXPLOSION AT ILKESTON.

On Wednesday evening, says the *Ilkeston Pioneer*, the people living in the neighbourhood of Stamford Street, Ilkeston, were alarmed by hearing a terrific explosion, which shook all the houses near. It was about half-past seven o'clock, and at the time an entertainment for the benefit of the Pleasant Sunday Afternoon Movement was about to commence in the New Connection Chapel, Stamford Street. It was soon ascertained that the explosion had taken place in the chapel, where Councillor Scattergood was preparing to give a number of dissolving views illustrating the subject of the entertainment. About 100 persons, principally women and children, constituted the audience, most of them sitting near the lantern, which was placed upon a table in the centre of the chapel. The oxygen gas was stored in an india-rubber bag, with a wooden frame-work, upon the top of which were placed three 56lb. weights. After the lantern had been lighted about a quarter of an hour, and just as the performance was on the point of commencing, a very slight explosion was heard, and this was immediately followed by a deafening report.

For a moment the whole place was illuminated, and then there was a crash of falling glass, and piercing screams, which were heard some distance away from the chapel. Of course the lights were blown out, and the place being in almost complete darkness added considerably to the terror of those who were present, as they could not form any adequate idea of what had occurred. The first impulse was to rush to the doors, and this was done in so frantic a fashion that those who were injured were trampled under foot. By the time a light was procured, most of those who were able to do so had made their way outside the chapel. Assistance was promptly at hand, hundreds rushing towards the building, having heard the explosion at a considerable distance away. Amidst the confusion it was almost impossible to tell who had been injured, many of those who had been seriously hurt managing to scramble outside. Here, however, their strength vanished, and most of them were carried to the Cottage Hospital in a very exhausted state. One poor lad, however, named Hubert Brewer, sixteen years of age, was so badly hurt that he died in a few minutes. He was found lying on the floor of the chapel, and was bleeding from a wound in the forehead, having apparently been struck with a piece of wood. His clothes were nearly blown off his body. He was promptly taken to the Cottage Hospital, but he was dead when he arrived. On examining his body, it was found that a piece of his jacket had been forced into a wound which penetrated to the heart, and no doubt this was the cause of death.

The force of the explosion seems to have been felt mainly on either side of the lantern, the boy Brewer having been sitting to the right, while those sitting at the back escaped comparatively uninjured. Another brother of the boy Brewer was also cut and bruised all over the body. So far as can be ascertained, the most severe injuries were sustained by two married women named Slack and Summerfield. Mrs. Slack lives in Lodge Row, Chapel Street, Ilkeston. She was sitting near the lantern, and had one of her eyes blown out, and her cheek laid open, her face being terribly lacerated. Mrs. Summerfield, who lives in Stamford Street, near to the chapel, had also au eye blown out, and the doctors fear she will lose the other eye. In addition to this, she is badly hurt about the limbs, pieces of the ulster she was wearing having been forced several inches into the wounds. Mrs. Carter, of 27, Carr Street, Ilkeston, was cut severely about the legs, pieces of her stockings having been taken from the wounds. Mrs. Cook, 114, Chapel Street, had a wound in her back, aud was trampled on when the stampede occurred. She does not appear to know how she was hurt. Mrs. Baggaley, the wife of a painter, living in Blake Street, had her face and one of her knees badly cut. Two boys named Grainger, aged respectively six and twelve years, whose parents reside at Hallam Fields, were sitting near to the unfortunate lad Brewer. The eldest boy said he was lifted in the air a good height. Both lads have severe wounds on their legs, the eldest being the worst injured. They were taken home in a cab. Mr. Wm. Ashley, of Wilmot Street, was present at the entertainment with his wife. He suffered so badly from the shock that he had to be carried home by the police, of whom a good force was promptly ou the spot. Mrs. Ashley had her face badly cut. Several others were more or less seriously injured, but up to the present their names have not been ascertained. Councillor Scattergood, who was standing at the back of the lantern, was knocked dowu, aud was hurt about the legs. He also suffered terribly from the shock, and was in a semi-conscious state yesterday morning, having been attended by two physicians. The chairman of the meeting was Mr. William Haslam, a member of the School Board. His wife was also present, and she seems to have been completely deafened by the explosion, though it may be only temporarily.

As stated above, most of those who were seriously hurt were taken to the Cottage Hospital, where they were attended to by Dr. Potter and Dr. Paton. After dressing their wounds, they were all taken to their respective homes, there not being a single bed at liberty in the hospit l. Others were attended to at their homes by other medical men in the town. On inquiry yesterday morning, it was found that several of the injured were suffering severely from their wounds, which are of a very serious character.

Our representative was permitted to view the interior of the chapel yesterday, everything having been left just as it was after the explosion occurred. This scene almost defies description. Every window in the sides of the chapel has been completely demolished, and the end windows have been bulged out and slightly broken. The chapel is at least 30 feet high, but such was the force of the explosion that the plaster was torn from the ceiling iu several places. The floor is strewn with broken glass, plaster, fragments of wood, portions of clothing and hats, while in many places it is bespattered with blood, as are some of the chairs as well. Several chairs which stood in front of the lantern are smashed, and there is a large hole through the floor, evidently caused by the falling weights after they had been lifted iuto the air. The lantern lies on the floor, and pieces of the cloth which covered the table have been blown to the ceiling. A mau's silk hat has nothing but the rim left, and an umbrella has been blown to fragments. Pieces of wood forming the frame-work of the oxygen bag flew in all directions, and one piece, which was blown into the gallery twenty yards away, smashed the double bass. The lantern slides lie amongst the *débris*, while the way in which the chairs have been thrown down and upon each other afford evidence of the pauic, which added to the injury caused by the explosion. Had the building been less lofty, it is almost certain the roof would have been lifted off. Hundreds of people rushed to the scene of the disaster in the shortest time, the news having spread like wildfire. It was impossible, however, to see in the darkness the extent of the damage done, which could not be adequately ascertained until yesterday morning, when crowds of people began to assemble from an early hour. The most exaggerated reports were spread in the town with regard to the injured, but, so far as can be ascertained, no bones have been broken, though the flesh wounds are of the worst character.

### OPENING OF THE INQUEST.

The inquest on the body of Hubert Brewer, fifteen years of age, of East Street, Ilkeston, who was killed in the magic lautern explosion on Wednesday night, was held at the Durham Ox Inn, Durham Street, Ilkeston, on Friday evening, before Mr. W. H. Whiston, coroner.

Mr. Wright Lissett (Town Clerk) and Mr. F. C. Humphreys (gas manager), were present to watch the inquiry on behalf of the Corporation; and the Rev. J. Parker and Mr. J. Briggs watched the interests of the trustees of Stamford Street Church. Superintendent Lumley was also preseut; and Mr. A. E. Hopkins (Messrs. Hopkins and Byron) represented the parents of the deceased.

The Coroner, at the outset, said there seemed to be a number of witnesses, and he would suggest that they simply take evidence of identification, and adjourn the inquiry until Tuesday next, at two o'clock, at the Town Hall, when they would go thoroughly into the matter. He had no doubt many who were connected with the injured would like to be present, and he did not think it was advisable to hurry the inquiry.

The jury concurred with the coroner's suggestion, and it was thereupon decided to adjourn, as stated, at the close of the proceedings, which were of a formal character.

[As we go to press, the report of the adjourned inquest reaches our hands. The lauternist was examined with regard to the cause of the explosion, and, after stating that he had taken every precaution to keep each gas to its own bag (he was usiug the mixed jet), propounded certain theories which he had formulated as to the origin of the mischief; but as these depended on the assumption that one of the bags was leaky, they are obviously untenable. The experts examined included Mr. Knowles, the chemist employed by the Birmingham Oxygen Company, Mr. W. M. Jackson, who holds a similar appointment with the Manchester Oxygen Company, and Mr. Chadwick, of Manchester, who for so long has been identified with lantern matters. These all agreed—and auy impartial person must hold the same opinion—that by some meaus the gases had become mixed iu the bags. That such a thing can occur without the kuowledge or mediation of the lanternist is evident from the case quoted in our leading article in to-day's issue. We must add that the jury acquitted Mr. Scattergood of all blame, and returned a verdict of accidental death.—ED.]

---

SOCIETY OF ARTS.—On Wednesday, November 25th, Professor Silvanus P. Thompson, D.Sc., F.R.S., read a paper on "The Measurement of Lenses," an abstract of which will appear in our next issue.

MESSRS. MORGAN AND KIDD'S WORKS AT RICHMOND.—Messrs. Morgan and Kidd have just completed important additions to the front of their works. The new building comprises offices and show-rooms, and makes the frontage of their premises a prominent aud ornamental feature of Kew Foot Road. They have now in progress the erection of another and larger building in the rear of their present premises, and on Saturday the foundation stone was laid by Mrs. Kidd in the presence of all their employées. Messrs. Morgan aud Kidd's business has outgrown their already large premises at all points. The extensive additions now in progress will be fully occupied as soon as ready, and the extra accommodation will enable them to carry on their work with greatly increased facility aud convenience.

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

19,377. Pearce Henry Crouch, 4, South Street, Finsbury, London, "Improvements in or connected with Photographic Cameras."

19,442. William Edward Crowther, Rock Villas, Londonderry, Ireland, "A Means of Steadying Photographic Cameras in Space during Exposure."

19,471. Julius Wagner and Georg Bredig, 433, Strand, London, "Apparatus for Developing, Fixing, and Washing Photographs."

19,565. John Burgess, 53, Chancery Lane, London, "An Improved Method of Producing Coloured Photographic Pictures."

19,574. Frederick William Broadhead, 323, High Holborn, Londou, "Improvements in Apparatus for use in connection with Flash-light Photography."

19,601. William Beyer, 5, Kelly Street, St. Pancras, London, "Improvements in Hand or other Cameras."

19,623. Edward Howard Percy Humphreys, 55, Chancery Lane, London, "Improvements relating to Dark Slides or Double Backs for Photographic Cameras."

19,706. Harold Holcroft, 55, Chancery Lane, London, "Improvements iu Apparatus for Washing Photographic Prints and Negatives."

19,767. William Wilson Horn, 151, Straud, London, "An Improved Photographic Vignetting Attachment." (Amos J. Lamborn, William Nuneviller, and William Knebber, jun., United States.)

### Specifications Published.

20,774. *Dec.* 20*th*, 1890. — "Photographic Camera Dark Slides." J. Pitt, 12, Belcher's Lane, Bordesley Green, near Birmingham, and W. Hudson, 118, Gooch Street, Birmingham.

Consists of a shallow box, preferably made of metal, with flange running round its outer edge. In this box is secured a rim allowing a margin round it so as to allow the lid to fall into. This rim is to hold the sensitive plate. The lid is hinged on one side of the box by means of wire passing through box from side to side. The lid working freely on its hinge, and forming a lever outside the box, enables the operator to raise the lid when the dark slide is in position in camera and so expose the sensitive plate; and, dispensing with the ordinary cap ou the lens, to enable operator to make instantaneous exposures, elastic springs are fixed to the lever and dark slide. The lid is kept closed by a catch, which can be released at will. The apparatus thus forms an instantaneous shutter and dark slide combined, aud can be attached to any camera.

21,059. *Dec.* 24*th*, 1890.—"Production of Photographic Negatives." G. F. Redfern. (J. M. Jordan, Philadelphia, U.S.A.)

The object is to effect the permanent marking of uames, titles, or other matter upon negatives. The title is printed directly upon the face, or film side, of the negative, the title, of course, appearing in reverse, in order that it will read properly upon the print. For the purpose of printing the title, rubber type is preferably used, the same being set up successively from right to left as usual, so that the reverse impression ou the negative will be produced.

13,799. *Aug.* 15*th*, 1891.—"Development of Photographic Pictures." O. P. Olvik and H. O. Morken, both of Stördslen, Norway.

Consists in apparatus comprising a bath and dark tent for the development of photographs, whereby the sensitive plate is not exposed to any injurious light, &c. The developing bath—of zinc, india-rubber, &c.—consists of a frame having a glass plate, or the like, secured water-tight in its bottom, and a similar plate in its top. The chamber thus formed is closed by a water-tight door. The plates are protected by metal covers. The developing liquid is poured into the chamber through a funnel and tube, which is bent at an angle to preveut admission of light, and, after being used, is discharged through a tube also bent and provided with a valve.

The inspecting device, only employed when developing by dull light, consists of a frame exactly fitting in the grooves for one of the plates, when the latter is removed, and of a casing terminating at the top in a rotatable tube shaped to fit the eye of the operator.

The dark tent is constructed of light waterproof cloth, on the same principle as an umbrella, the euds being stretched by ribs hinged to runner notches sliding along a stick, and kept in position by stop springs. The ends close inwards when folding; while the longitudinal parts will lie wrapped round the middle part of the stick. Over two manipulating holes in front of the tent mufflers are placed, with elastic bands, to fit over the hands of the operator. In front of the tent is also an opening with elastic band, which closes it. A red-coloured glass plate, through which the inside of the tent may be inspected, and a piece of red translucent cloth admitting the necessary light, are also provided.

16,094. *Sept.* 22*nd*, 1891.—"Producing Photographic Pictures having Colours resembling those of the Objects from which they are obtained." V. Mathieu, 155, Fenchurch Street, London.

A negative is taken in the usual way, preferably upou a glass or other surface, so sensitised as to be as nearly as possible orthochromatic. After this negative has been retouched where necessary, a priut is taken of it on a paper so prepared that the gradations of shade in the negative are accurately reproduced in the print. The print is then toned and fixed in the usual way, after which it is mounted, whilst still wet, on a frame, and allowed to dry. When dry, the back of the print is treated with alcohol, in order to coagulate the albumen, and upon it is then poured a mixture of alcohol and Venice turpentine, the proportion being preferably equal parts of each. The priut is then subjected to a strong heat in a hot-air oven, and, when dry, another coating of the mixture of alcohol and Venice turpentine applied, and again dried, and so on in succession until the print is found to be crisp and absolutely transparent. It is then coated with a varnish of isinglass, upon which oil-colours are then applied in the ordinary way with a brush.

## Correspondence.

### DR. MADDOX AND DRY PLATE PHOTOGRAPHY.

Sir,—January, 1868, W. H. Harrison made a gelatine emulsion, which, for reasons suggested by himself, gave results that were "worthless."

September 8th, 1871, Dr. R. L. Maddox published a gelatine bromide process, aud produced and showed results with it, which are probably in existence now.

July 18th, 1873, Burgess advertised emulsion made with gelatine; he offered details of the process to "subscribers willing to pay one guinea each," &c.

Burgess, then, was uot only two years behind Maddox, but he tried to sell as a secret process what Maddox gave away.

*Cromwell House, Bexley Heath, S.E.* Andrew Pringle.

Sir,—An appeal has just appeared, signed by Mr. Pringle, with reference to the testimonial which is being raised for Dr. Maddox. It is my wish to draw the attention of your readers to a certain statement contained in that letter, but before doing so, I would clearly state that I recognise the worthiness of Dr. Maddox on more grounds than one, and, under the circumstances, also the desirability of benefiting him in the way proposed.

Mr. Pringle states that every photographer knows that the discovery of the gelatino-bromide process is due to the experiments of Dr. Maddox. It can be stated with perhaps far more truth, that it is impossible to find a man who benefited by what Dr. Maddox published, or who thought the result of the experiments encouraging.

The assumption is that Dr. Maddox was the original worker with gelatine emulsion. To say the least, this is au unwarrantable assumption. The facts of the case are on record, and these conclusively prove him to be not first, nor second, nor yet third, with such experiments as he performed with the emulsion; and, what is more remarkable still, his experiments—in which he ouly obtained prints and not negatives—were far less successful than some which are recorded in the photographic jourvals of 1865, 1866, and 1868. If I am not mistaken, Mr. Traill Taylor ought to know somethiug of this, for specimens of work done in a similar way, and with a formula very closely allied to those of the preseut day, were submitted to his notice in 1865.

I do no more than meution these dates, the records of which unmistakably prove that Dr. Maddox was not the first to do such work as that of which he published an account in 1871, aud, indeed, in that very account Dr. Maddox himself states that his experiment is not to be regarded as anything new. At the same time, if his claiu to be regarded as the father of the present system is still to be pushed, I shall ask permission to lay before your readers and the general public a fuller history of this subject than has yet appeared.

Many people are doubtless content to accept the *ipse dixit* of well-known men, but iu a matter of this kind, when the facts are recorded as they are, there need be and can be no dispute.

I enclose my card, but do not wish my name to be published at present. QUI PALMAM MERUIT, FERAT.

## Proceedings of Societies.

### London and Provincial Photographic Association.

At the meeting of this Society held ou the 19th iust., Mr. A. Cowan officiated as chairman.

Mr. G. Pendrey, introduced by Mr. A. L. Henderson, showed some specimens of vitrified enamels on plates and tablets. No information was given as to the method of production.

Mr. Davis showed some fine trausparencies developed with paramidophenol chlorhydrate, and handed round some samples of the developing solutiou, made up as follows, for the purpose of experiment by the members :—

| | |
|---|---|
| Paramidophenol ... ... ... | 8 parts |
| Water ... ... ... ... ... | 1,000 ,, |
| Dry sodium carbonate ... ... ... | 40 ,, |
| Sodium sulphite ... ... ... | 80 ,, |

The developer acted quickly, and might be used eonsiderably diluted.

Mr. A. Haddon said that at a previous meeting Mr. Smith had handed him a sample of a substance said to be serviceable in photography, and wished to kuow its composition. He found it to be sulphate of manganese.

Mr. Smith said that the salt was for use in the sensitising bath in photo-lithographic work, and it was stated that by using it a freedom was obtained in the ink leaving the paper. The formula for use was—

| | |
|---|---|
| Bichromate of potash ... ... ... | 50 parts |
| Water ... ... ... ... ... | 1,000 ,, |
| The salt now known to be sulphate of manganese... ... ... ... | 5 ,, |

Mr. J. Barker showed a print on Ilford printing-out paper which he had toned with the ordinary acetate bath. It was not necessary to use the special sulphocyanide bath recommeuded.

Mr. W. E. Debenham thought the sulpho-cyanide bath better, on account of the quantity of gold deposited by it, rendering the probability of permauence greater.

The slides sent in by members for the lantern competition were then put through the lantern. Four negatives had been used, and the results from each were compared in a pair of lanterns, the voices of the majority present deciding which of two was to be considered the better, after which the successful one was used as the standard of comparison until another was thought to surpass it. For the most part, the slides were of excellent quality, and selection became difficult; but, in the end, the awards resulted as follows :—

| Slides from negatives taken at | First award. | Second award. |
|---|---|---|
| Shire ... ... | T. A. Freshwater (Collodio-albumen). | H. D. Atkinson (Commercial lantern plate). |
| Richmond Bridge... | T. A. Freshwater (Collodio-albumen). | G. W. Atkins (Commercial lantern plate). |
| Cottage Garden ... | J. S. Teape (Lantern plate, hydroquinone). | F. C. Kellow (Lantern plate, pyro). |
| Portrait ... ... | E. W. Parfitt (Pyro carb. ammon.) | F. C. Kellow (Pyro). |

After the competition, a set of slides of trotting horses, taken broadside on with a shutter tested to work iu the $\frac{1}{500}$ of a second, was shown by Mr. L. Medland, and was followed by others sent by Messrs. Davis, Low, Sergeant, and Henderson.

### Camera Club.

*November 19th.*—Mr. W. England in the chair.

Mr. G. L. Addenbrooke read a paper on "Aluminium and its Applications to Photography," in which he briefly described the methods of productiou of the metal, dwelling upon the circumstauces which have led to the cheapening of its price. The qualities and characteristics of alumiuium for casting, solderiug, rolling, and for working generally were given, and the lecturer concluded by describing the utility of the metal for photographic purposes.

Some excellent examples by the Phœnix Engineering Company were on exhibition in the room.

At the lantern eveniug on November 30th, Mr. Frank Haes will exhibit his slides showing what was done in "The Early Days of Auimal Photography." On December 3rd, Mr. A. R. Dresser will treat the subject, "Toning Bromide Paper and Transparencies," with demonstration and illustration.

### Holborn Camera Club.

*November 20th.*—Mr. Fred Brocas in the chair.

Mr. J. G. Hudson demonstrated with the "Kolm," a light for taking portraits at night. The apparatus was shown at the P.S.G.B. exhibition, and has also been demonstrated before the members of that Society at one of their meetings. It is an arrangement whereby magnesium is blown into a spirit flame, giving a steady light for any length of time necessary to take a portrait. The light is shown behind ground glass, and the smoke is carried away by a curved funnel. It burns very little magnesium, and gives au excellent light. It is a simple though ingenious contrivance, and serves its purpose admirably. Mr. Hudson exposed half-a-dozen plates in the room on single portraits, and a group. These were afterwards developed, aud turned out exceedingly well.

The arraugements for patentiug the "Kolm" have just been completed.

### Brixton and Clapham Camera Club.

*November 19th.*—Dr. Reynolds in the chair.

The committee reported that they had inspected some rooms which they thought would be more suitable than their present quarters, as they were larger, more couvenient, and had the advantage of a room adjoining with a sink with hot aud cold water laid on, which could be used as a dark room and for demonstration purposes. After discussion, it was resolved that the Club take up its abode at the Clarence Rooms, 376, Cold Harbour Lane, Brixton, without delay, and that a reception be held on 18th December to inaugurate the opening.

### Richmond Camera Club.

*November 20th.*—Mr. Cembrano in the chair.

Mr. Herbert Fry gave a demonstration of the development of "Opals and Ivorytypes." After some remarks on the relative merits of the ferrous oxalate and hydroquinone developers, and the advantage of an acid fixing bath (hypo and acid bisulphite of soda), in substitution for the usual acid clearing bath before fixing, Mr. Fry exposed and developed with hydroquinone an opal and a celluloid (or so-called ivory) film, explaining the processes and giving formula as he went along.

In the report of last week's meeting, "caramel with glycerine" was inadvertently written for "caramel with gelatine." The reporter expresses the hope that, if anyone has tried the former backing, he may live till it is dry.

---

DERBY PHOTOGRAPHIC SOCIETY.

ON the 17th inst., at Smith's Restaurant, Victoria Street, Derby, the "New Hampshire" lantern slides (seventy), lent by the Liverpool Amateur Photographic Association, were exhibited by means of the oxy-hydrogen lantern.

Mr. Bendle W. Moore was elected a member of the Society.

Mr. RICHARD KEENE presided, Mr. C. J. CHADWICK gave the connective reading to the slides, and Messrs. Mills and Scotton, jun., worked the lantern.

---

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

*November 23rd.*—Mr. J. SAVILLE in the chair.

Mr. T. C. JONES read a paper on the "Working of Black and Sepia Platinotype Paper," demonstrating his points as he went along. He said that the process was at once the simplest, quickest, and cleanest of all photographic processes of printing. The most suitable negative was one full of gradation obtained by a full exposure and a rather slow development, but not necessarily dense. The paper had been greatly improved during the last eighteen months, and would yield good prints from any ordinary negative. The lecturer said that prints made from a negative with moderate contrasts showed the shadows of a dull orange tint, lighter and different in tone from the other parts. The parts were solarised, and the prints would develop correctly. Thin negatives would not produce this effect. Hard negatives would, when developed, show heavy blacks in the shadows; such prints required hot and prolonged development. It was difficult to say what amount of detail should be visible in the print before development, but usually all parts of the picture except the detail in the highest lights should be visible. Paper which had been kept some time under proper conditions would yield best prints from hard negatives; 130° F. might be considered the standard temperature. Over-exposed prints might be saved by cool, and under-exposed prints by hot development. The developer, when stored away for future use, should be kept from the action of a strong light, and it was a good plan to add a little fresh developer to the working solution on each occasion of using it. It was advisable to give three clearing baths for five, ten, and fifteen minutes respectively, to the prints after development. With few exceptions, the sepia process was similar to the black. It was more easily affected by light, therefore increased care must be taken in handling. The special solution must be used in the developer, and the same dishes must on no account be used for both processes. The temperature must be from 150° to 160°. Discolouration of the whites would be due to want of sufficient special solution in the developer, exposure of the developer to light, the use of dish with cracked enamel, exposing the iron, paper kept too long, or exposure of the prints to light while clearing. Porcelain dishes carefully heated were best for the sepia process. The faults usually found in beginners' work were as follows:—(1) Prints grey and wanting in vigour; probably due to (*a*) under-printing, (*b*) a weak negative, (*c*) cool or too short development, or (*d*) a weak developer. (2) Black spots or black or grey smears; caused by tearing the paper, allowing particles of the sensitive salt to be sprinkled over the print, and reduced there on development. (3) Rusty prints; the paper was stale or damp, or the developer was at fault. (4) The whites were degraded; if grey, the paper or the developer had been exposed to too much light; if drab, the paper was stale or damp. To prove if the paper was at fault, develop a piece which had not been exposed to light after clearing; if not white, it had deteriorated. (5) The shadows were "eaten out," resembling brown paper; cause, solarisation. Some give a longer and hotter development, on no account removing from the bath till the salts had been thoroughly reduced in the shadows.

One member was elected, and three candidates for election proposed.

---

MIDLAND CAMERA CLUB.

*November 20th.*—In the Library, Queen's College, Birmingham, Dr. HALL EDWARDS in the chair. Fifteen new members were elected, making a total of sixty-three at the second meeting of the Club. Dr. Leech offered a prize of a hand-camera if the Club intended to hold any competition at the end of the winter season.

The lantern was then brought into requisition by Messrs. Warren and Welford, and the slides were described by each member. Prof. Allen showed several of Somerset churches; the President, a few home portraits and some sketches made in lead pencil upon ground glass, afterwards made transparent by varnishing. These latter, he said, were extremely easy to do, and the surface admitted of the most delicate shading. The Hon. Secretary showed hand-camera shots, flash-light work, and isochromatic results against ordinary plates. Mr. Welford showed hand-camera work, and the following exhibited varied sets:—Rev. J. Henry, I. J. Perry, Fred. Iles, W. W. J. Nicol, R. J. Bailey, and Wm. Bentley. Dr. Maberly showed a series of Norway slides.

The next meeting will be held on Dec. 4th, when "The Keeping Qualities of Gelatine Dry Plates," by Dr. Leech, will be the subject for consideration.

---

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE annual meeting was held on November 13th, when the following were elected officers for the ensuing year:—

*President*—Mr. G. A. Carruthers; *Vice-President*—Dr. W. H. Hunt; *Council*—Messrs. Paul Lange, H. F. Stanistreet, G. Latimer, C. B. Reader, G. E. Thompson, H. B. Millar, W. T. Briggs, A. F. Edwards; *Lanternist*—Mr. W. A. Norrish; *Librarian*—Mr. J. A. Forrest; *Auditors*—Messrs. A. Bradbury, H. S. Nicklin; *Hon. Treasurer*—Mr. W. A. Brown; *Hon. Secretary*—Mr. F. Hope Jones, Prenton, Birkenhead.

The reports of the Secretary and of the Treasurer having been submitted, the president, Mr. G. E. THOMPSON, gave an interesting and instructive demonstration on "Finishing of Transparencies." An exhibition of slides by various members terminated the proceedings.

It was decided to extend the time for sending prints in for competition until the date of next meeting.

---

OXFORD PHOTOGRAPHIC SOCIETY.

*November 17th.*—Mr. H. MINN gave an explanation of the process of collodio-bromide emulsion making for transparencies. The interest of his remarks was increased by the making and finishing of a half-plate positive, which was admired for its clearness and good tone.

Mr. W. W. Fisher, M.A., Aldrichian Demonstrator in Chemistry, The Museum, and Public Analyst, was elected a member.

It was decided to have conversational meetings on alternate Mondays, in addition to the ordinary meetings on the first and third Tuesdays in the month.

---

BRECHIN PHOTOGRAPHIC ASSOCIATION.

*November 19th.*—Mr. MACKIE in the chair.

The subject for the evening was the Chairman's paper on hand-camera work. After speaking on the various points of what he considered a good hand-camera, Mr. Mackie took up the development of instantaneous exposures, recommending dry pyro with ammonia and bromide of potash. He afterwards showed a selection of lantern slides to illustrate his paper. The lantern lamp used was Stocks' patent, kindly sent down by Mr. Stocks for exhibition. The general opinion was that the lamp was a considerable improvement on the ordinary form of paraffin lamp, the chief points of improvement in it being an adjustable chimney, and the reflector outside the combustion chamber.

Dundee and East of Scotland Photographic Association.

*November 20th.*—The chief business of the evening was a demonstration by Mr. H. M. Smith, of the Eastman Company, who brought under the notice of the members a new rapid bromide paper, which could be toned to a sepia tint—a colour preferred by many to the cold steel-blue tone of ordinary bromide paper. Referring to the kodak camera, he recommended the larger sizes, from quarter-plate and upwards. From twenty to twenty-five feet was about the best distance for a hand-camera from the nearest object. Mr. Smith exhibited a series of lantern slides, comprising views in England, Wales, and several Continental countries, all taken with a kodak camera on quarter-plates and 5 by 4.

In the competition for enlargements, the prizes were awarded as follows :—First, Mr. D. Ireland, two views of a Norwegian fjord ; second, Mr. J. Munro, St. Monan's and Perth Bridge.

Photographic Society of Japan.

A meeting was held at No. 9, Kaga-Yashiki, Tokyo, on the 4th inst. The object of the meeting was to give members an opportunity of testing the rapidity of their instantaneous shutters.

A fly-wheel, rotated by a crank, and having a silvered glass ball attached to the periphery, was fixed up, with a seconds pendulum alongside of it. By watching the seconds pendulum it was very easy, after a little time, to make the wheel revolve at a uniform rate of sixty revolutions a minute, or one a second. Immediately that a uniform speed of sixty revolutions a minute had been attained, an exposure was made with the shutter to be tested. On development of the plate, the angular motion of the wheel was indicated by the length of line traced out by the silvered ball, and it was a very simple problem to work out the exposure in the form of the fraction of a second.

The shutter that worked the most quickly was the "Caldwell." This, at its highest speed, gave an exposure estimated at ouly $\frac{1}{125}$ of a second. Of the rapidest of the other shutters tried, none gave as little as twice this length of exposure. The longest exposure that was "instantaneous" (not "time") was $\frac{1}{13}$ of a second.

Photographers who do "instantaneous work" have generally notions vague, to say the least of it, about the exposures they are giving. The tests made by the Photographic Society of Japan go to prove that by far the greater number of "instantaneous exposures" are somewhere between $\frac{1}{20}$ and $\frac{1}{60}$ of a second.

An interesting feature of the meeting was a trial of speed, by several of the members, in hand exposures—"cap off and on." It was shown that more than one member could give an exposure as short as $\frac{1}{5}$ of a second by hand without shaking the camera at all. It was found advisable to use a very loose cap.

Three new members were elected.

This report has been delayed on account of the time necessary to work out the exposures of the various shutters from the markings on the plates exposed.

North London Photographic Society.—On December 1st, in Wellington Hall, Islington, at 8.15 p.m., there will be an optical lantern display, to which visitors are invited.

London and Provincial Photographic Association.—Dec. 3rd, "The Exaggerated Perspective of Wide-Angle Lenses"; Dec. 10th, "Warm Tones in Lantern Slides"; Dec. 17th, monthly lantern night.

Glasgow and West of Scotland Amateur Photographic Association.—On the 17th inst., a paper was given by Professor A. Humboldt Sexton, of the Technical College, on "Kallitype and Kindred Printing Processes," of which he gave a demonstration. There was exhibited a large and fine collection of lantern slides.

A Photographic Veneer.—A recent invention covers the use of certain forms of collodion for the application of photographs to cabinet-ware. The inventor applies the print to the wood to be decorated, and the surface is afterwards polished by pressure on a metallic surface. The invention has for its principal object the veneering of furniture.

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

Questions requiring a reply in this column, which have hitherto been addressed to Mr. Spiller (who, unfortunately, is unable at present to continue his efficient assistance), should be sent to the Editor.

All other Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

Walker.—Chlorate of potash in combination with any preparation of which sulphur forms part is an extremely dangerous explosive, for it will ignite uot only with heat, but by percussion. There is no need to employ chlorate in flash-light mixtures at all. The powdered magnesium used by itself is all-sufficient. It is not generally known that a mixture of this metallic powder and chlorate of potash forms a mixture which behaves, when ignited, like gun-powder.

A. H. H. (Surrey).—An exhaustive article on the subject is now in print for the Year-Book, and, as we gather from your letter that you are not in immediate need of the information, we refer you to that source in preference to giving necessarily brief directions in this columns.

Jap.—It is difficult, if not impossible, to get dense negatives of line subjects on rapid plates, but there is no difficulty at all if you use those of moderate speed. Professional workers use the wet process for this class of negative almost without exception. You will, however, secure equal results by employing the photo-mechanical plates made by Mawson ; or those of Mr. England, Notting Hill. We have secured excellent negatives on both these brands of plates.

Varnish.—A fairly elastic varnish, suitable for the purpose named, can be made by adding shellac to a saturated solution of borax, and shaking every now and then until the gum is dissolved. This is a matter of some days. Now add any black pigment in fine powder, and stir it well into the mixture. This varnish is a quick drier.

O. Bevan.—You will find the information you want in Captain Abney's paper on light, which we publish in this issue. The burning of magnesium in oxygen is, of course, not new, but the application of the light to printing purposes is distinctly so. Send in your suggested remarks by all means, and we shall then be able to see if we can find space for them.

F. H.—You will see that the matter to which you refer has not been overlooked. We quite agree with your comments upon it.

Mercia.—The safety-gauge is made by Clarkson.

Mona, C.—Our own suspicions point that way, but the question need not be revived.

Kandy.—Try a saturated solution of the cyanide instead of the five per cent. mixture which you have been using.

Isleworth.—The patent office specifications are open to all, and if you have no time to make the search yourself, there are many idle ones who would be glad to do so for a small fee.

Ismay, R.—The arrangement would at the best be but a makeshift, and after your trouble you would only be disappointed.

## The Photographic News.

SUBSCRIPTIONS.

Including Postage to any part of the United Kingdom :—
Yearly...10s. 10d. | Half-Yearly...5s. 5d. | Quarterly... 2s. 9d.

To the United States, the Continent, and the Colonies :—
Yearly ... 13s. | Half-Yearly ... 6s. 6d. | Quarterly ... 3s. 3d.

To India (Yearly) ... ... ... ... 15s. 2d

*For Advertisement Scale see page v.*

THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1735.—*December* 4, 1891.

CONTENTS.



## ABOUT SOME LANTERNS.

THE lantern has now become almost as familiar to amateur workers as the camera, but, unlike the latter instrument, it requires great care in working—that is to say, if it be fitted with lime-light. Much has lately been written about its capabilities as a means of instruction, and its use has even been advocated as an aid in religious services. There could be no possible objection to such recommendations if the worthy writers who ventilate their views would only seek some acquaintance with the working of the instrument itself. This they commonly neglect to do. It is sufficient for them that the lantern will be an effective handmaid to them, and they talk as airily of the manner in which it is used as if the operation were as easy as the spinning of a top. And yet, as all who have had any experience with the instrument must know, the lantern should not be handled by anyone new to the task without several words of caution.

This universal cry for more lantern work has had one bad result, which, however, in the natural course of things, must be of a temporary nature only. It has caused a great influx of rubbish in the shape of optical lanterns, and the creation of a certain class of dealers who know somewhat less of the instrument than do their customers. It has been our fortune, within the past year or so, to be appealed to by many persons who have bought cheap lanterns—at least, they are by courtesy called cheap—and who have forwarded or brought the instruments to us in order that we may pronounce an opinion upon them. This we invariably decline to do, in the first place, because we do not care to increase the number of threatened actions for libel which is the common lot of newspapers to receive; secondly, because we have no time for experiments with apparatus which, at a glance, we see to be useless; and thirdly, because we do not care to run the risk of bodily injury from "fooling around," as the Americans say, with faulty apparatus. But "faulty" is no word to describe some of the fearful and wonderful instruments which come to us in this way; "fraudulent" would be by far the better adjective to employ. In what other way could we describe a lime burner with the jet attached to the gas supply tubes with *solder?* But we will not multiply examples, although we could easily do so. Let it be sufficient to point out that the first risk run by the aspiring lanternist is not from contact with mixed gases, but from contact with one of these low-class dealers.

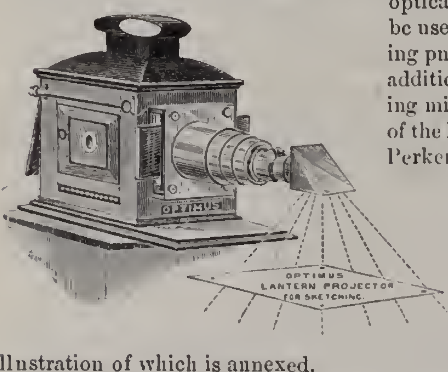
We have expressed the opinion that the evil is only of a temporary kind, for a man who sells rubbish becomes known sooner or later, and his trade declines. But it must be remembered that such traders could not go on for long unless they had clients ready to patronise them. Some people—and well-to-do people too—will take a vast amount of trouble to save a few shillings in a purchase. There are many well-known dealers in lanterns who would not, for any sum offered to them, allow a faulty instrument to leave their premises. Their names are known all over the civilised world for the excellence of their work, for which they charge a fair price. But the buyer of the type already alluded to takes no count of all this. He is deluded by the specious advertisement of a dealer of mushroom growth, buys his lantern, and, when he has found how worthless the thing is, is only too glad to sell it at a fraction of its cost.

An inexperienced buyer is very apt to be deceived by the outside appearance of a lantern. A case of this kind came under our personal notice only a few weeks back. We were asked to lecture at a large provincial hall; a lantern, which was described as "a magnificent triunial," being provided by the promoters. Upon entering the room, this gorgeous instrument at once attracted our attention, so brilliant was it in its array of polished mahogany and lacquered brass. "What do you think of that?" said our guide. Our answer was that we would reserve our opinion until we saw the instrument at work, whereupon the operator lighted up his jets, and we handed to him a test slide. This was a birdseye view of a portion of London, full of detail, and as perfect a picture in other respects as it was possible to procure. When projected by this gorgeous lantern on an eighteen-foot sheet, the picture was edged all round with a three-foot margin of fuzziness. We forget what the lantern cost its owner, but we remember well that the sum was quite sufficient to have enabled the seller to fit it with the finest lenses procurable, and at the same time to have netted a profit of about one hundred per cent.

As a cure for this lamentable state of things, which must be deplored by all honest traders, we venture to suggest a remedy. It may be difficult to carry out in many cases for want of room, but we feel certain that any dealer in lanterns adopting it would find it advantageous in the end. Let the *bonâ fide* purchaser have a practical demonstration of what the lantern which he is buying is capable of before the transaction is completed. No other test can really be relied upon. Such demonstration could be carried out in a warehouse full of goods if no other apartment were available, for the lantern could be placed high up so as to shoot over any obstacles which encumbered the floor. A fixed screen, and a means of shutting out the daylight, would complete the arrangements. The purchaser would then be able to see the amount of light afforded by oil lamp or lime jet, and the difference in definition given by a cheap lens and a more expensive one. In many cases he would in this way be tempted to spend far more money than he originally intended. It might also be worth consideration on the part of dealers to give free lessons to purchasers, or to charge a fee to others for practical instruction in the working of the lime-light.

## NEW AIDS TO LANTERN WORK.

Some weeks ago we published an article showing how the optical lantern may be used for sketching purposes by the addition of a sloping mirror in front of the lens. Messrs. Perken, Son, and Rayment have embodied our suggestions in their 'Projector,' an illustration of which is annexed.




The same firm have also just introduced a new form of lantern slide carrier, which possesses the advantage of enabling the lanternist to change the pictures without running any risk of dulling the glass by finger-marks. The sketch will show that the picture is raised from its groove by a lever, when the worker can easily grasp it by the edges.


## PHOTOGRAPHY AS AN ART.

BY A "POSTULANT."

I have waited over two months in the hope that some one better qualified than myself would challenge some of the statements in the excellent paper on "Photography as an aid to Illustrative and Pictorial Art," published in the August number of the Journal. Considering the position held in the world of art by the writer, my anxiety to see some one else enter the lists with the learned Superintendent of the Calcutta Art School was only natural; but, as evidently there are many of my way of thinking who are as prudent as myself, I am compelled by circumstances to come forward in the photographic interest. I yield to none in my admiration of the lecturer, and I am firmly convinced that his open, candid speech will do more to further the artistic claims of photography than the more voluminous labours of smaller men. But—and unfortunately this is a big "but"—he was a painter before he became a photographer, and, in not putting off the old love before he took up with the new, he has committed himself to statements which photographically whole-hearted men like myself cannot allow to pass unquestioned. I trust Mr. Jobbins will recognise my position, and forgive the contentious temerity of one who would far sooner be his disciple than his opponent.

To be thorough, I should take an initial objection to Mr. Jobbins' remark that he did not "wish to exalt photography at the expense of art, and in the great essentials photography has no place." This subject has, however, been so threshed out in the English journals that the repetition of the arguments advanced in support of the claims of photography would only unnecessarily weary my readers, and it would be unprofitable to waste time and precious space on a question which has practically been settled in our favour. I shall confine my observations to the rather startling proposition by Mr. Jobbins that "it is vain for the photographer to try to infuse into his work the undefinable charm of great artists like Millet or Corot. Millet only gives the essentials, religiously keeping out what was unnecessary; his hard-worked and uncomplaining peasants were the embodiment of the silent toil of centuries. Photography at its best can only give you facts; they may be subdued by being out of form, but still they are there. Nor can photography give you the poetry of an evening as Corot did, where you saw the gentle ripple on the water, the breeze shaking the leaves on the trees, and the feeling of peace and repose." These are hard words indeed, and decide without due caution such debatable questions as—(1) Are facts incompatible with art? (2) Does the undefinable charm of all works necessarily lie in an airy suggestiveness of essentials unsupported by facts? and (3) Is it true that Millet's embodiment of the silent toil of centuries owes its charm to exclusion of detail, or is the feeling inspired in the spectator properly traceable to a poetic association of ideas. A dozen other controvertible points might be suggested, but I have no desire to model this protest to the shape of a Scotch sermon, with its eighteenthly and nineteenthly, and I think the three questions, if fully considered, will meet all requirements.

First, is fact opposed to art? With due deference to Mr. Jobbins' opinion, I must insist that it is not. I shall go further, and say that, unless a picture is so based on facts that the foundation is evident to the most careless observer, it can have no claim to art. In this view I have the support of Ruskin, who says that "he who is closest to nature is best. All rules are useless, all genius is useless, all labour is useless, if you do not give facts; the more facts you give the greater you are; and there is no fact so unimportant as to be prudently despised, if it be possible to represent it." In reality, a close and constant reference to facts is the only certain criterion of the value of a picture as a work of art. "Tell any man, of the slightest imaginative power, that such and such a picture is good, and means this or that; tell him, for instance, that a Claude is good, and that it means trees, and grass, and water; and forthwith, whatever faith, virtue, humility, and imagination there are in the man, rise up to help Claude, and to declare that indeed it is all 'excellent good, i' faith'; and whatever in the course of his life he has felt of pleasure in trees and grass, he will begin to reflect upon and enjoy anew, supposing all the while it is the picture he is enjoying. Hence, once a painter's reputation is accredited, it must be a stubborn kind of person indeed whom he will not please or seem to please; for all the vain and weak people pretend to be pleased with him, for their own credit's sake, and all the humble and imaginative people seriously and honestly fancy they *are* pleased with him, deriving, indeed, very certainly delight from his work, but a delight which, if they were kept in the same temper, they would equally derive (and, indeed, constantly do derive) from the grossest daub that can be manufactured in imitation by the pawnbroker. Is, therefore, the pawnbroker's imitation as good as the original? Not so. There is the certain test of goodness or badness, which I am always striving to get people to use. As long as they are satisfied if they find their feeling pleasantly stirred and their fancy gaily occupied, so long there is for them no good, no bad. Anything may please, or anything displease, them; and their entire manner of thought and talking about art is mockery, and all their judgments are laborious injustices. But let them, in the teeth of their pleasure or displeasure, simply put the calm question—Is it so? Is that the way a stone is shaped, the way a cloud is wreathed, the way a leaf is veined? And they are safe."

Admitting, then, that all true works of art must be based on, be inseparable from, facts, we pass on to the second assertion of Mr. Jobbins, that only essentials should be given. The proposition is somewhat vague, as no attempt has been made to define "essentials." It may include anything from loose impression to microscopic detail. Judging from his admiration of Mrs. Cameron's works, and the fact that he is a painter, I take the remark to mean that the lecturer objects to the inclusion in a picture of any detail not absolutely essential to the working out of the artist's conception, or for a communication of the story told to the observer. It is not difficult to see that Mr. Jobbins speaks only as his artistic training permits him to do. Human hands cannot possibly depict the wealth of delicacy of nature; the futility of the attempt has been recognised, and from the knowledge has arisen an impression among painters that detail is objectionable—a convenient doctrine enough, but one that requires refutation as incorrect and misleading. No work can properly lay claim to greatness or completeness unless it is *finished* by the addition of *facts* to the utmost possible extent. All true finish is *added fact.* Hear again what Ruskin has to say on this point: "If you will lie down on your breast on the next bank you come to (which is bringing it close enough, I should think, to give it all the force it is capable of), you will see, in the cluster of leaves and grass close to your face, something as delicate as this, a mystery of soft shadow in the depths of the grass, with indefinite forms of leaves, which you cannot trace nor count, within it, and out of that, the nearer leaves coming in every subtle gradation of tender light and flickering form, quite beyond all delicacy of pencilling to follow; and yet you will rise up from that bank (certainly not making it appear coarser by drawing a little back from it), and profess to represent it by a few blots of 'forcible' foreground colour. 'Well, but I cannot draw every leaf that I see on the bank.' No, for no human work could be finished so as to express the *delicacy* of nature. Accept that necessity, but do not deny it; do not call your work finished, when you have, in engraving, substituted a confusion of coarse black scratches, or in water-colour a few hazy blots, for ineffable organic beauty. Follow that beauty as far as we can, remembering that just as far as we see, know, and represent it, just so far your work is finished; as far as you fall short of it, your work is *un*finished; and as far as you substitute any other thing for it, your work is spoiled. How far Turner (the greatest landscape artist that ever lived) followed it is not easily shown. Every quarter of an inch of Turner's drawings will bear magnifying in the same way; much of the finer work in them can hardly be traced, except by the keenest sight, until it is magnified. In his painting of 'Ivy Bridge,' the veins are drawn on the wings of a butterfly not above three lines in diameter, and in one of his smaller drawings of Scarborough, the mussel-shells on the beach are rounded, and some shown as shut, some as open, though none are as large as one of the letters of this type; and yet this is the man who was thought to belong to the dashing school, literally because most people had not patience or delicacy of sight enough to trace his endless detail."

Coming from the source it does, I should scarcely wish for anything more emphatic in the evidence in favour of photography. It should be our glory and our pride that we and we alone can reproduce the flickering forms, subtle gradation of light, and the redundant beauty of nature. Yet we are called on to follow humbly a branch of art based on impotence, and glorying in its imperfection. People can readily form artificial standards of taste, and we have not far to go to see club feet and wasp waists regarded as the perfection of beauty; but let us not follow the ruck, and surrender an undoubted distinction for an artificial ideal. We shall, of course, be called unartistic if we use our power to record all the detail that the eye sees, but that does not much matter. When it is counted a virtue that Leonardo drew every several vein in the little agates and pebbles of the gravel under the feet of the St. Anne in the Louvre; that Titian painted, petal by petal, the borage blossoms lying loose on the table in the "Supper at Emmaus" in the Louvre; that Tintoret painted carefully the strips of black bark on the beach trunk sustaining the platform in his "Adoration of the Magi"; and that Bellini filled the rents of his ruined walls with the most exquisite clusters of the Erba della Madonna (Linaria Cymbalaria), we need not regard the jeers of those who condemn detail because they cannot compass it. By this I do not mean to reflect on Mr. Jobbins, whose great artistic talents are known over India, but he has been trained among painters who despise detail, and his statements must be received with caution.

It would be amusing, were it not pitiable, to observe how completely we are subject to the fetish of tradition. The painter says photography can never rise to the heights of art, because selection is scarcely possible to us, and we can only reply that by careful combination printing we can select to some extent. Shall we never release ourselves from the false trammels that bind us? Will the time never come when we shall claim the highest place in the temple of art because of our undiluted truth? A story is related of a young German painter who had been travelling in Italy, and had brought a portfolio of sketches, remarkable alike for their fidelity and their purity. Every cottage, every cliff, every tree at the site chosen, had been drawn; and drawn with palpable sincerity of portraiture, and yet in such a spirit that it was impossible to conceive that any sin or misery had ever entered into one of the scenes he had represented. It was very interesting to observe the minute emendations by which this was effected. To set the tiles the slightest degree more in order on a cottage roof; to insist upon the vine leaves at the window, and let the shadow which fell from them naturally conceal the rent in the wall; to draw all the flowers in the foreground, and miss the weeds; to draw all the folds of the white clouds, and miss those of the black ones; to mark the graceful branches of the trees, and, in one way or another, beguile the eye from those which were ungainly; to give every peasant girl whose face was visible the expression of an angel, and every one whose back was turned the bearing of a princess; finally, to give a general look of light, clear organisation, and serene vitality to every feature in the landscape—such were his artifices, and such his delights. And yet, comments our greatest art authority, "his work had, nevertheless, its stern limitations and marks of everlasting inferiority. Always soothing and pathetic, it could never be sublime, never perfectly nor entrancingly beautiful; for the narrow spirit of correction could not cast itself fully into any scene; the calm cheerfulness which shrank from the shadow of the cypress and the distortion of the olive, could not enter into the brightness of the sky that they pierced, nor the softness of the bloom that they bore; for every sorrow that his heart turned from, he lost a consolation; for every fear which he dared not confront, he lost a portion of his hardiness. The unsceptred sweep of the storm clouds, the fair freedom of glancing shower and flickering sunbeam, sank into sweet rectitudes and decent formalities; and, before eyes that refused to be dazzled or darkened, the hours of sunset wreathed their rays unheeded, and the mists of the Apennines spread their blue veils in vain." Rise, brother photographers, in your might, and refuse longer to play the part of Yahoos to painting Houyhnhnms.

And now I come to the question, wherein lies the charm of certain paintings not burdened with much detail? Though I contend that detail is an advantage, I am prepared to admit that the very highest form of art leaves something to the imagination—stimulating it, in fact. In such cases the artist interprets nature to us; we see with his eyes, and hear with his ears, recognising in him the mind of a "God-made great man." But this is very different from the ostentatious exclusion of detail, when detail is seen in nature, and if works in which such elimination has been carried to excess please, the pleasure arises from association of ideas. The enjoyment, however, in almost every instance is confined to men of strong poetic feeling, who are apt to be the very worst judges of painting. As Ruskin says: "The slightest hint is enough for them. Tell them that a white stroke means a ship, and a black stain a thunderstorm, and they will be perfectly satisfied with both; and immediately proceed to remember all that they ever felt about ships and thunderstorms, attributing the whole current and fulness of their own feelings to the painter's work; while probably, if the picture be really good, and full of stern fact, the poet or man of feeling will find some of its facts *in his way*, out of the particular course of his own thoughts; be offended at it, take to criticising and wondering at it; detect, at last, some imperfection in it, such as must be inherent in all human work, and so finally quarrel with and reject the whole thing. * * * And thus, in a slovenly or ill-finished picture, it is no credit to the artist that he has 'addressed the imagination'; nor is the success of the appeal any criterion whatever of the merit of the work. The duty of an artist is not only to address and awaken, but to *guide* the imagination; and there is no safe guidance but that of simple concurrence with fact."

Photography, however, has its limitations, though this arises not from any inherent defect, but from the lateness of the discovery of making light pictures. Historical pictures and works of pure imagination are not within our reach. Take, for instance, Tintoret's "Adoration of the Magi." We know that the fair young Madonna, the type of purity for all ages, is the unaltered portrait of a young Venetian girl, the Magi are unaltered Venetian senators, and the figure with the basket an unaltered market woman of Mestre; but in the painting we see not the models, we recognise only the lofty ideals. Now we might get exactly similar figures, dress them similarly, and pose them before the camera in identical positions, and yet fall far short of the painting. The spectator will never succeed in forgetting that the persons portrayed were other than those intended to be represented. Yet I do not see that this fact proves the inferiority of photography. The painting is most undoubtedly valuable, but supposing our art had been known at the advent of the Redeemer, and a photograph had been taken of the adoration of the Magi—hard facts and nothing more—which would have been more precious to us, the painting or the sun picture? Would we not have sacrificed art and all that the world holds for us, to behold with reverent love her whom all nations call "blessed," our life, our sweetness, and our hope?

I shall close here for the present, but before doing so I may remark that there is a grain of truth in the assertion by Mr. Jobbins—"Nor can photography give you the poetry of an evening as Corot did, when you saw the gentle ripple on the water, the breeze shaking the leaves on the trees, and the feeling of peace and repose." No, photography cannot show the ripples on the water, nor the breeze shaking the leaves, for these do not exist in nature at eventide. As Mr. Jobbins says, we give *facts*. —*Journal of the Photographic Society of India.*

The Teachers' Guild of Great Britain and Ireland.—The *Journal of Education*, in its issue of December 1st, publishes the report of the Council of the above Guild, from which it appears that "it is proposed to make a collection of lantern slides, to be kept at the offices of the Guild, for loan to members. Mr. William Rice has promised a duplicate set of a prize-medal series of slides as the nucleus of such a collection. Amateur photographers are invited to contribute any spare slides of a specially educational character which they may possess. Parcels should be addressed to the Offices of the Guild, 74, Gower Street, W.C.

## Short Notices of Books.

Photographische Optik. (*Halle a. S.: Wilhelm Knapp.*)
The greater portion of this book consists of the substance of lectures delivered before the Club of Amateur Photographers in Vienna, collected and arranged by Anton M. Haschek, who, while modestly disclaiming the title of a scientific work for his production, has presented a very useful treatise on the nature and application of photographic lenses. The value of the book is increased by the addition of chapters respectively on "The Choice and Testing of Lenses" and on "Photometry." The whole is comprised in 96 pages, with 68 illustrations.

Die Negativ Retouche nach Kunst und Naturgesetzen. By Hans Arnold. (*Leipzig: A. Hartleben.*)
Works on artistic retouching are few in number, and this excellent manual will be found by readers of German a valuable addition to the photographic library. Devoted mainly, as its title would indicate, to the art of retouching, it nevertheless embraces useful hints on lighting, exposure, and development. The work consists of nearly 500 pages, and the text is illustrated by 53 diagrams.

The Handbook of Photographic Terms. By William Heighway. (*London: Piper and Carter.*)
This is a second edition, revised and enlarged, of an alphabetical arrangement of the processes, formulæ, applications, &c., of photography. As an improvement on the first issue, favourably noticed in these pages, the book may be commended as highly useful for ready reference.

A Casket of Photographic Gems. (*Same Publishers.*)
Another book of reference, collected, classified, and alphabetically arranged by W. Ingles Rogers. It consists of a collection of 500 dodges, receipts, entertaining experiments, &c., in connection with photography and its branches, the early exhaustion of the first large edition of which is a sufficient testimony of the appreciation the book has won. The advantage for ready reference afforded by the numbered alphabetical arrangement of the subjects is increased by a full and carefully prepared index.

The Lighting in Photographic Studios. By P. C. Duchochois. (*London: Hampton, Judd, and Co.*)
The object of the book, as stated by the author, is to give the principal rules to be observed in posing, and some advice to guide the student. This is achieved in eight chapters, embracing, among other matters, various modes of distributing the light, construction of the glass house, backgrounds, lighting of the model, treatment of the eyes, development in relation to the lighting, and the use of orthochromatic plates in portraiture.

Lantern Slide Printing Frame.—Mr. J. Dore, of Sandown, calls attention to an invention for which the provisional patent application has been accepted. It is a neat, compact frame, so made that a vignetting apparatus can be used in front. The frame is for contact printing only, and will be found especially valuable where a number of slides are wanted from one negative. Mr. Dore states that the frames, which can be supplied in any size required, will be placed on the market for sale in a few days.

## THE LANTERN MICROSCOPE.*

BY W. I. CHADWICK.

In lantern microscope projection three things are essential: the first is brilliant illumination, the second large amplification, and the third clear display of detail. But brilliant illumination does not mean a dazzling display of light upon a large white screen, showing the dark, patchy outline of an object without detail. Objects shown in this way are far inferior to enlarged wood-cuts. The light must be made to enter the object so as to present all the details of its structure to the eye of the observer; but no amount of light will bring out this detail if its dimensions are too small for the crystalline lens to form an image of it upon the retina. With high-power objectives the light on the screen must, in the very nature of things, be greatly subdued. Still, a large image, moderately but properly lighted, can often be far better observed than a small one many times brighter; an object may, in fact, be too powerfully illuminated. If rays of great angle are too powerfully converged upon an object, the image becomes almost as bright as the other parts of the screen, which represent nothing but clear glass, and in this case the image appears "flat," and without contrast—like an over-exposed photograph. The image may, therefore, be too bright for the screen, or it may be too dark, and the best results are those obtained with the mean, showing all detail without destroying contrast. A lantern microscope, to be of any satisfactory use, must define, for instance, such objects as stellar hairs of deutsia, the minute, lace-like structure of spine of echinus, the matted structure of the hairs of reindeer, the lancet of male flea, its sucking tube, &c. The stomata of leaves are very easy to show. Foraminifera of the smallest sizes should be exhibited to from seven inches to ten inches diameter with all their varied beauty of form and shading. The tongue of the bee should have all its structure clearly displayed to audiences of three or four hundred people. For this purpose it must be magnified to about twenty feet long; then the bulb at the tip of the fleshy cone should be shown with the hairs standing out from the trunk and circling round it, apparently marking off its various parts as if they were joined to each other in telescopic articulations; the muscles of the trunk, and the apparently, and no doubt really central air tube connected with the trachia, ought all to be well defined; and what has been said regarding these objects applies equally to all kinds of animal and vegetable structure.

It is not claimed for the lantern microscope that every object, however delicate, can be shown as perfectly as in the ordinary table microscope, or that photo-micrographs are henceforth unnecessary. But it is, notwithstanding, absolutely certain that the lantern microscope now takes rank amongst the scientific instruments of the day, and can no more be dispensed with than the optical lantern itself. It is claimed that, by the Leach lantern microscope, all we have said can be done, and a very great deal more, though to say that anybody can do it perfectly on a first trial would be as wild a statement as to say that anybody who buys a camera and lens can at once produce beautiful photographs, or to guarantee the man who buys a piano to be able to play it to the best advantage. The Leach microscope can be applied to any oxy-hydrogen lantern. It is screwed on the front in place of the ordinary lantern objective, the size of flange required being two and a-half

* Read at the Royal Microscopical Society, October 31st.

inches. When the lantern objective flange is larger than this, an adaptor must be provided, and when the draw-tube of the lantern is "ricketty," a rigid lengthening tube may be adapted. The lantern condenser should be about four inches or four and a-half inches diameter, and of the triple form. Ordinary lantern condensers are usually of the double form; but a third lens can be supplied for a few shillings. The stage of the microscope is open at both sides, and at the top also, and serves for all classes of objects, whether ordinary microscopic slides or polariscope crystals, shown with either narrow-angle rays or by the convergent system of lenses. The stage being so constructed, it is extremely accessible for the introduction of sub-condensers, with which the instrument is provided, and permits, with the greatest convenience, the introduction and manipulation of the polarising prism, which latter may be entirely rotated, so that all the phenomena of polarised light may be exhibited to the greatest perfection. The object-holder is quite a novel idea; the principal mechanism of it is placed under the stage (to be out of the way); two arms passing through slots in the bottom of the stage, actuated by a spring and manipulated by a milled head, serve to hold the objects flat against the inside surface of the front of the stage. The diaphragms, or compound wheel of diaphragms, and the mechanism in connection with it, is unique. The wheel of diaphragms is rotative on a pivot attached to the plate arm in such a manner that the whole may be raised out of the field altogether and dropped into it again in an instant, or just as required; and when the compound wheel of diaphragms is raised, a spring catch holds it in position and prevents it dropping by its own weight. When in this position, the whole field of the microscope can be utilised for showing objects up to one and a-half inch in diameter; thus, this compound wheel of diaphragms of two and a-half inches in diameter yields just as large a field as can be obtained by one of the ordinary form of five inches in diameter. When, as in using polarised light, it is desired not to be incommoded with the diaphragms, the detachable plate carrying the compound wheel can be instantly removed from the stage, and when again required it can be as quickly restored. The arms of the object-holder projecting through the bottom of the stage have sufficient lateral movement to admit any zoophite trough or wooden frame, or combination of wooden frames, up to one inch in thickness. Thus, the advantages of this arrangement are clearly manifest. The two sub-condensers with which the instrument is provided are found to give the utmost satisfaction with all objectives of from 2½ inch to $\frac{4}{10}$ inch focus, and the simplicity with which these sub-condensers are changed is another feature of novelty in the instrument. All that is necessary to make the change is to take out one and push the other in its place; thus, the exhibition or demonstration may proceed without a moment's delay, neither object, objective, nor diaphragm being disturbed. When the light has been properly concentrated, as is the case with Leach's microscope, high powers can be used, and with ample illumination for showing all necessary detail, either for class-room instruction or lecture-hall demonstrations. It should also be observed that when high powers are used, the front lens of the objective is open to the view of the manipulator—a great convenience when inserting the object, by enabling it to be immediately adjusted within the area of the lens, so that its image may at once be seen in the field without the tiresome "groping" for it, a method which is usually resorted to with other lantern microscopes.

The advantages of this arrangement will be at once apparent, especially when using, say, a $\frac{1}{12}$ inch or higher power for photo-micrography. When polarised light is to be used, the polarising prism must be pushed into the rotating tube of the instrument by removing the concave lens at the back, and after inserting the prism this concave lens may be replaced in an instant. To do this when ordinary lanterns are used, the usual draw-tube carrying the microscope must be removed for the purpose; but with a Chadwick optical lantern the microscope need not be disturbed. All that is necessary is to disconnect the bellows attached to the lantern front, and the back of the microscope is at once accessible for the removal of the concave lens, and insertion of the prism, &c., and this may be done in less time than it takes to describe the operation; thus, the change from common to polarised light can be made in a few seconds.

The rotating tube will be found an immense advantage over fixed tubes, as the polarising prism can, by this arrangement, be placed in any desired azimuth which best suits the object, the analyser, or the screen. The convergent system of lenses for use with polarised light in transmitting rays through biaxial crystals, is a system of lenses worked out by Mr. Leach with great patience. It gives powerful illuminations, and includes an angle of 170°. The front-focussing arrangement was introduced by Mr. Leach in 1883. Before that time several supplementary lenses had to be kept in readiness for use, as different classes of crystals were placed in the polariscope. Mr. Leach discovered how these supplementary lenses might be dispensed with, and fitted up his system accordingly, and now all makers of first-class polariscopes attach to their instruments this great improvement. The concave field-lens with which the instrument is provided is absolutely necessary when the polarising prism is in use. It is useful also with low powers when using common light. With all powers it enlarges the field and equalises the distribution of illumination; but when a small field only is desired, with the illumination in the centre, it may be used or dispensed with at pleasure.

The three objective adaptors with which the instrument is provided admit of any microscope power with the standard screw. They are made to slide in the front tube of the microscope, which is provided with a rack-and-pinion, and also with a fine screw movement capable of the most delicate adjustment. Thus, by having the various powers already screwed into the adaptors, one may be changed for another almost instantaneously; and into the front or tube portion of these adaptors the tube of the amplifier is made to slide. Amplifiers usually supplied with lantern microscopes are simply uncorrected lenses, perfectly worthless for the purpose for which they are intended. The amplifier with which Leach's microscope is provided is a Barlow lens, and being achromatic, it not only does not destroy, but very much enhances, the aplautic qualities of the objective, and is far superior to so-called "projection eye-pieces." It has been inconsistently asserted by persons who ought to know better "that high power cannot be used in the lantern microscope, that it is unable to exhibit fine detail upon the screen, and that no alum trough is required." No doubt this is all true so far as applied to inefficient and "jim-crack" arrangements. But the microscope now before us *does* require an alum trough, because, where great light is concentrated from the oxy-hydrogen luminant, great heat must, from the very nature of the means employed, be concentrated with it, and the alum trough is the only practical thing which can be used to absorb the heat rays. Of course, where there is no light there is no heat, and therefore no necessity for an alum trough, and instruments which do not require one are self-condemned. The alum trough provided for the Leach microscope is of large size, and is used in the ordinary slide-stage of the lantern.

At the conclusion of the paper, a demonstration was given by common and polarised light.

## ON HALATION.*

BY H. G. HAMMOND SPENCER, C.E.

I imagine that everyone who has worked much as a photographer has had a painful experience of the disappointment felt on finding a negative, otherwise perfect, completely ruined by halation. I can speak feelingly on the subject myself, as I have been a great sufferer during the season. Halation is apt to appear wherever there are parts of the negative very brightly lit, and in contact with other parts of a dark colour—as, for instance, in a landscape where the dark foliage of trees is against a bright sky, where the effect is produced of more or less of the edges of the foliage, or dark object, being considerably lighter than they ought to be. It is halation which, in a winter scene, causes the fine branches at the edges of trees to be lost to sight on the negative. In my ignorance, I used formerly to imagine that it was only in photographing interiors, where the contrasts are so great, that halation need be feared, but I have found that it is as much so in landscapes.

Halation is caused by the rays of light passing through the film and glass plate, and, striking the air at the back, are refracted through the plate *at an angle*. Therefore the thicker the plate, the greater the space struck by these refracted rays, and the wider the appearance of halation. Were it possible to have the glass plate of no appreciable thickness, there would be no appearance of halation. It is for this reason that one is not troubled with it when films are employed instead of plates. It has been found that when a plate is very thickly coated, halation is reduced to a minimum, because the rays of light do not penetrate the thick coating. Those, however, who, like myself, use the ordinary or cheap description of plates, have not this safeguard. In the old days of collodion, one did not suffer from this trouble, except, perhaps, in interiors with great contrasts, and that was because the collodion produced a thick coating.

I think that, when taking a negative, it is highly desirable to produce the very best of its kind that one is able to, and that any trouble taken to secure this result is by no means thrown away. I have therefore, since being first troubled with halation, read a good deal on the subject, and have made experiments in accordance with what I have read. All agree that whatever is applied to the back of the plate must be in optical contact with it. It has been found that if the back of the plate is ground, the halation is almost entirely cured. I have not had an opportunity as yet of making the experiment, but I have thought that, as matt varnish is quite usable as a substitute to ground glass, it would be quite possible to use it as an efficient backing against halation, if ground glass is so.

There are numbers of mixtures recommended as backing for plates: ground burnt sienna made into a cream with glycerine, water, gum, and spirits of wine. This is very much the same as "Tylar's backing," which I have found to be efficient.

I read that black American cloth smeared with glycerine and squeegeed on the back of the plate is a remedy. I tried this, but I found that the glycerine would not "take" on the American cloth, possibly because the latter was new. I therefore tried putting glycerine on the back of the plate, and then squeegeeing on non-actinic paper. I took two views on two plates thus prepared. There was a very bright light, all in favour of halation; but the defect was absent except in a small bit of foliage near the edge of the plate, and where the non-actinic paper was wanting.

The drawback I found in the use of glycerine was that it was liable to run on to the woodwork of the slide and swell it. Tylar's backing dries quickly, and therefore does not do this. It has, however, to be washed off with a damp sponge before developing the plate, and I have thought it the cause of some minute pinholes. All my plates used at the last outing to St. Peter's Valley were backed with this. I see that in England they now use a mixture of caramel (or burnt sugar), burnt sienna, and gum; and in one of the meetings in London this was highly spoken of. Some use caramel and gelatine; I should myself think this difficult to remove. I have not yet tried caramel, but purpose doing so at an early opportunity. In experiments made by Mr. Debenham on different kinds of backings—nine in number—he found that the most effective of all is a mixture of gum, sugar, and Chinese ink.

* Abstract of a paper read before the Jersey Amateur Photographic Society.

## INTERNATIONAL PHOTOGRAPHIC EXHIBITION, LEEDS, 1891.

The preliminary arrangements for this Exhibition, which is likely to prove one of the most important ever held in the country, are now rapidly approaching completion. The exhibits are numerous, and, for the most part, of the highest order of merit and importance; and, fortunately, the wall space at the disposal of the committee has enabled them to hang the frames in such a way that every work may be seen to the best advantage.

The judges—Messrs. Valentine Blanchard, F. P. Cembrano, W. England, J. Gale, and A. Pringle—will award the medals on Friday and Saturday next, and the Exhibition will open with a *conversazione* on the evening of Monday, December 7th. Arrangements, we understand, have been made for lectures, with lantern illustrations, by eminent men on at least three evenings a week, and these will be given more frequently should it be thought desirable. On the other evenings there will be music, and occasionally in the afternoons as well. The Press day will be Monday, December 7th.

Croydon Camera Club.—Subject for December 7th, "The 'Open Sesame' of Successful Photography," by Mr. H. Maclean, F.G.S.; 21st, lantern night; members' slides.

Camera Club.—On Monday, December 7th, there will be the usual monthly Club Smoking Concert; on December 10th, at 8 p.m., Mr. T. R. Dallmeyer will give a "Short Description and Demonstration of New Telescopic Lens for Photography"; Dr. Fison's lecture will commence at 8.30 p.m.

## Notes.

If the shade of Guido Fawkes still haunts this earth, he must have been much interested in a case which came before the law courts, strangely enough, on the fifth of November. The case depended upon the truthfulness or otherwise of a certain photograph, which depicted two sportsmen in the act of firing their weapons, one using the old-fashioned black powder, and the other the nitro compound known as smokeless powder. This photograph had been issued broadcast as an advertisement by the Schultze Powder Manufacturing Company, in order to demonstrate that, while the sportsman with the old "villanous saltpetre" was so enshrouded with smoke that he could not see where to aim his second barrel, the patron of Schultze remained in an unsullied atmosphere.

Messrs. Curtis and Harvey, not believing in the genuineness of the picture, published a pamphlet entitled, "Notes on Shooting," in which they described the question of smoke as having been made a matter of trade chicanery, and commented upon photographs of this description as gross exaggerations, and the attempt to mislead people by them as highly reprehensible. Major Young, an amateur photographer as well as a sportsman, who was called for the defence, said that it was almost impossible to photograph smoke correctly, and that photography could be the biggest liar under heaven. But this strong language did not help the jury to come to a decision, for, after an absence of two hours, they were discharged verdictless. As the case remains undecided, we express no opinion one way or the other. We quote the case as an interesting example of photographic evidence.

The use of the optical lantern in places of worship is not quite such a new idea as Mr. Stead appears to think. For many years it has been customary to have lectures on all kinds of subjects, illustrated by the lime-light, in chapels belonging to different sects, the proceedings commonly commencing or terminating with a hymn sung by the entire congregation, the words of which are thrown on the sheet. But, even in the conservative Church of England itself, such things are not unknown. In a certain church near Manchester, the vicar, last Lent, conducted a series of week-night discourses illustrated by lime-light pictures, and we understand that whereas, in previous years, the attendance of worshippers had been extremely small, the innovation attracted crowded congregations.

A useful suggestion with regard to development comes from Mr. W. E. Crowther, of Londonderry. He proposes that, instead of the common practice of returning the developing solution to its cup when any addition is made to it, the accelerator and restrainer should be kept at hand in vessels fitted with a spray producer, so that the alkali, bromide, or citrate, as the case may be, can be showered in fine rain upon the plate as it lies in its dish. It is evident that local strength or reduction can be easily secured by this means. The common form of spray producer used for scent, with a rubber ball for furnishing the air supply, can be readily adapted to the purpose.

The Association Litteraire and Artistique Internationale, which, it will be remembered, held a meeting in London last year at the Mansion House, has just issued its annual report, which has been prepared by M. Bulloz. The bulk of the document is taken up by a consideration of the new American copyright regulations as affecting photographs. These regulations, under Order 4,956, impose an obligation to deposit in the Governmental Library two examples of the photograph to be protected. It is also provided that such examples so deposited must be printed with plates made in the United States, or from negatives or *clichés* executed in that country.

M. Bulloz naturally enquires how these conditions can be complied with. How, he asks, can a photograph of Mont Blanc, or of St. Peter's, Rome, be executed on American territory? If it is to be done at all, the photographer, immediately after taking a photograph in Europe, must hurry to the United States, and there, having developed it before witnesses, claim to have it protected. Again, if he wishes to register the copy of a picture purchased, say, in Europe, he must have the picture sent to America, pay the excessive charges which the legislature has imposed upon works of art, and make the negative in the United States. It is obvious, as M. Bulloz points out, that America denies itself advantages possessed by other countries for the dissemination of art knowledge, under the mistaken notion of protecting native photographers.

The McKinley Tariff is like Nasmyth's steam hammer, which welds a girder or cracks a nut with equal facility. In the matter of the importation of photographs, the tariff is ridiculously oppressive, and loud complaints are beginning to be heard. A recent ruling of the Secretary of the Treasury makes the sending of photographs and photographic reproductions through the post illegal, and much annoyance, so we learn from the New York *Manufacturer and Builder*, has been caused in consequence. The character of these importations is, says our contemporary, almost exclusively artistic and educational, and artists and professional men, including engineers, architects, and teachers, will be seriously inconvenienced by the enforcement of this unnecessarily harsh order. So rigid, indeed, is the enforcement of the order made that even photographs and other pictures that may be sent to private individuals through the post are now promptly confiscated and sent to the Custom House, to be redeemed under penalties, or sold. No wonder the *Manufacturer and Builder* declares its inability to see what advantage the Government expect to derive from these regulations.

Local traditions often have a substratum of truth, but they are rarely confirmed in every particular. An instance of this has, however, been established by the British Archæological Association. It has always been a local belief in connection with Stonehenge that on the morning of the longest day in the year, the sun always rose in a line with the well-known Friar's Heel. To ascertain whether this was so, the Rev. J. M. Bacon, in company with Mr. Howe, of Newbury, visited the spot at midnight on the verge of the longest day, and watched for the rising of the sun from the altar stone. When the sun was visible Mr. Howe took a photograph, and this photograph, which was exhibited at the last meeting of the Society, shows the phenomenon perfectly.

## SPIRIT PHOTOGRAPHS.

BY JAMES MEW.

"What a weak, credulous, incredulous, unbelieving, superstitious, bold, frightened—what a ridiculous world ours is, as far as concerns the mind of man! How full of contradictions, inconsistencies, and absurdities it is! I declare that, taking the average of many minds that have recently come before me, and accepting, for a moment, that average as a standard, I should far prefer the obedience, affections, and instinct of a dog before it. Do not whisper this, however, to others." So wrote, on July 25th, 1853, from the Royal Institution to Professor Schönbein, Michael Faraday. Not many years afterwards, in spite of the concluding sentence of his letter, this letter—and others perhaps equally private—were published in the ordinary course of things for the gratification of public curiosity—*scire volunt secreta domus.* Faraday's letter was written after his well-known attempt to turn the tables on the "table turners." How would he have spoken of spirit photographs?

This subject is a serious one—some photographers certainly have found it so—and therefore it deserves serious treatment, which, indeed, it has occasionally encountered. It cannot be adequately treated, even in the slight and superficial manner of those writers who have made it a matter for scoffing comments, without more spiritual knowledge, and more sense of—if we may be allowed the expression—ghostly perspective, than they possess, and lacking which they would have done wisely to leave the matter alone. There are, indeed, some who have not hesitated to mix with this subject the profanity of satire; have seen fit, in fact, to treat it as a huge joke. The result is somewhat ghastly, and in the worst possible taste. Whatever views these writers, or any others, may hold as to the existence or otherwise of spirits who are ready and willing, in their airy amiability, to put an honest penny into the pocket of the hard-working photographer by sitting—this word of custom escaped us in a heat—by hovering around to have their portraits taken at so much a head; however numerous and ingenious the arguments that may be advanced to prove the non-existence of these beings; or, granting their existence, the impossibility of their having their carte-de-visites taken by any firm of photographers however able, the fact still remains that, from the lips of those whose scientific knowledge is generally allowed to be deep, there have fallen words pregnant with very precise meaning concerning the reality of these mysterious portraits.

Very early, indeed, in the short but eventful history of spirit photography, unbelievers sprung up and chattered about the necessity of keeping the imagination within bounds; of not allowing it to run away with the judgment; of idle superstitions, a disgrace to an age of boasted progress; and of a vast flood of ignorance overflowing and laying desolate the highest places in the land. They talked of the taking of spiritual portraits as an attempt to investigate phenomena which reason would not for a moment allow; which, so they said, are, in fact, utterly absurd. They professed to explain the taking of spirit photographs in the following irreverent fashion. The negative, they said, is taken of an engraving, or of some other picture, or of a lay figure with a powdered face, or of a puppet properly painted for the purpose, or of a living person arrayed in suitable cerements posed against a black velvet background in the attitude desired. Then this negative is turned, collodion superimposed, and the glass fixed in the camera. Thus the portrait of the sitter is on one side, and of the spirit on the other. When the negatives are printed, the paper is placed against the sitter-side of the glass and exposed to the light. The spirit on the other side then strikes through the glass, giving that hazy appearance which is so much desired to the spirit while the portrait of the sitter comes out clear, solemn, and well-defined. Or, again, a reduced positive is made from the negative of a practicable spirit, and then, in a dark room with a feeble light, the new plate is submitted to two or more short exposures behind it, care being taken that no light reach the remainder of the plate. The outline of the spirit is rendered indistinct by avoiding close contact with the positive. The photographer goes to the house of his customer to avoid, in his opinion, the possibility of fraud, and selects a plate marked beforehand as suitable to the occasion.

It is now some thirty years ago since a certain Mumler or Mumbler—for the orthography of his name in contemporary records is uncertain—was prosecuted for fraud in America in the matter of spirit photographs. This was, indeed, an inauspicious commencement, but we live in a world ever ready to believe in evil, to disbelieve in good, to imprison those who labour for its advantage, and to burn its benefactors at the stake. Mumler or Mumbler was not, however, the only martyr. Another gentleman who took angelic portraits by flashes of lightning—not, as he was careful to explain, ordinary lightning, but lightning, so to speak, expressly adapted for this purpose—was treated with similar ingratitude by an apathetic constabulary. Alone, at midnight, in a season of wind and rain, with his camera pointed to the heavens—a camera containing plates overlaid with a composition of certain unusual chemicals, the names of which he naturally declined to disclose—this good man obtained his weird pictures at his own imminent deadly risk in the intervals of the darkness of the storm. Nay, he did more. He absolutely courted the investigation of the incredulous, a piece of audacity which accelerated his downfall, and backed his dusky portraits of the dead for twenty-five dollars.

This unlucky artist brought down his spirits from the skies, but they are found also in an opposite direction. We meet them everywhere. Their range of motion is exceeding wide. A very effective ghost was at one time connected with an innocent river view at Ipswich. The photographer thought only to take the river and its surrounding scenery; but lo! when the plate was developed, there appeared plainly revealed in the foreground of the picture the figure of a woman. She was tall and fair, her hair floated behind her, long as Victor Hugo says, *comme un manteau de roi*, and her raiment wss white as the driven snow. She appeared in an upright position on the surface of the stream. A spirit photograph! It was at once, but perhaps too hastily, concluded, considering the range of ghostly motion already mentioned, that murder or suicide had happened here. Policemen were summoned and the river was dragged. Many objects of interest were discovered, but no human body.

On this occasion a sceptic suggested, as an explanation of the uncanny marvel, the possibility of a small hole in the cupboard or box in which the gelatine plate had been kept, combined with a feminine curiosity and love of research. This same unbeliever it was who, at another time, with equally weak faith, was for photographing "materialised spirits" by magnesium light, doubting the ability of the dead—a feeble folk as they are presented by Virgil—to withstand the intensity of its glow. The medium was a tall, angular woman with a nose like the tower of Lebanon, which looketh towards Damascus—a nose approaching the parrot order of architecture. She occupied a position near a curtain in a corner of an apartment, reposing in the dim religious light generally required as reverential, if not advantageous, on such occasions. The customary fees were collected. Nothing, even in the spirit world, is, it seems, to be had for nothing. The magnesium light was turned on. Covered about with white veils, divers forms were produced, in the eyes of some of the spectators angelic, but the gentleman who had suggested the magnesium light—a hard-shelled investigator of nature's marvels—found in them all a family nasal resemblance to the officiating medium. He might consider himself fortunate to have found anything. The presence of a disbeliever in the flesh has, in the majority of cases, been declared antagonistic to spiritual manifestation. Whether it is that the ghosts are insulted by any scintilla of doubt in their existence—it is a matter we should feel acutely ourselves—and so, in a pet, refuse to put in an appearance, or whether it be that the so-called "spirit-control" of the operator—the middleman, as it were, of two worlds—is weakened by the too earnest attention of infidels, it is difficult to determine. Possibly both these causes have their influence. The spirit might be persuaded if the control were more energetic; or, again, sufficient energy of control might be counterbalanced by an excess of spiritual indignation or perversity. The cause lies hidden—*causa latet, vis est notifsima.* In this highest reach of the photographic art, the supramundane portraiture of those who are said, euphemistically, to have "gone before," the disconsolate bereaved ones left behind must not, by any stubborness of unbelief, be the occasion of too severe a strain or drain on the odic force of the operator. They must come fully prepared to see spirits, or they will never see them.

It is not mountains alone that faith is able to move. Without faith the medium may summon spirits from the vasty deep, or elsewhere, but when they are called for they will not come; or, if they come at all, they will appear in an altogether unsatisfactory—nay, sometimes disgraceful—condition. A case has been recorded of capricious spiritual behaviour in which the shadow of the bereaved one was on the right while that of his mother-in-law or grandmother, gone before, was on the left. The hierophant being desired to explain this apparent anomaly, declared that the spirits brought their own light with them, and, being themselves shadows, were not subject to the ordinary laws of shade. The explanation was accepted in all good faith for the nonce, but it seems clear that this inversion of natural custom was rather occasioned by a huff taken by the spirit at the presence of a sceptic. To a like cause may be attributed an extraordinary spirit photograph, which represented a spirit in an attitude which astonished the medium — who might be supposed accustomed to freaks of spiritual perversity—no less than the awe-stricken company of spectators. The spirit had chosen to present itself in an altogether indecent manner—indecent, that is to say, according to the time-honoured conventionalities of this world. The spirit was feminine, and its head was on the floor, and its heels were in the air. Utterly careless was this lady ghost of the rule made and provided by the respectable author of the *Religio Medici*: "Let the divine part be upward, and the region of beast below; otherwise 'tis but to live invertedly, and with thy head unto the heels of thy antipodes."

So scandalised were the good ladies and gentlemen who attended this photographic *séance*, that they demanded their money back again, holding themselves unjustly treated. It is to be hoped—if, indeed, the story be true, and not rather the invention of some flippant scoffer—that they got it; but at the same time, they ought to have considered the limitless possibilities of change in the spirit world. One, who wished to behold the idol of his infant daughter, was violently indignant on being presented with the portrait of an aged gentleman bearded like the pard. He did not pause to consider the chances of development in a state of untried being. But there are, it may be said perhaps without exaggeration, millions of people who believe firmly that the form of the body will be altered in the next world in a manner corresponding with its behaviour in this. The Buddhists suppose that an impudent person will therein assume the appearance of a monkey, and that he who holds the murder of innocent animals to be sport will be turned into a devil.

Due consideration of these philosophical notions, a proper regard for the theory of *Karma*, or action which controls the destiny of all sentient beings, not by rewards and punishments of omnipotence, but by the inflexible law of cause and effect, would prepare us for some remarkable transformations in the bodily presentments of our deceased friends, and would save the spiritual photographer considerable labour of not altogether satisfactory explanation. For to say, for instance, as has been said, that one's camera is charmed would not, probably, be quite sufficient to quell the cynical curiosity of the man of science. Nor again, if a setting of family faces—spirit faces—well known to Brown, surrounded a portrait of Jones, would it be considered by Jones an exact apology if it were said, as has been said, that spirits are accustomed to gather themselves into the camera in minute particles, and infringe sometimes on the sensitive plate in an altogether reckless fashion? Some may hold this exposition to be affected with more than Sibylline obscurity, but we must remember it ever has been, and always will be, difficult to convey to the carnal-minded a sense of spiritual things.

Enough, it is hoped, has been said in this article to give the reader pause before he pins his faith to captious objections composed in a jocular style, apparently the offsprings of commonplace books put together by writers without any reverence for sacred things. So solemn a subject as spiritual photography, which these writers have chosen for their flippant jocosity, must seem to every properly disposed mind, if not altogether unsuitable for discussion, at least to be approached in some other style than these writers have thought it decent to adopt.

---

Royal Institution of Great Britain, Albemarle Street, W.—The general monthly meeting will be held on Monday, December 7th, at 5 p.m.

The Hand-Camera at the Polls.—The hand-camera is said to have taken an important part in the recent election in Philadelphia. Forty-two hand-cameras were employed, one for each division of a certain ward where "repeating" was expected. A man was easily found who knew his own division thoroughly, and who, when he suspected a "repeater," could "press the button" on him. By comparing photographs after the fight, "repeaters" could be discovered and brought to justice with very little trouble.

## PORTRAITURE.*

BY W. H. PERINE.

Portraiture work is, I think, without dissent, the most intricate part of photography, the one in which the artistic eye and good taste of the man behind the ground glass shows to the best advantage. It is no trick to take a portrait. Put your model in a chair, in as good a light as possible, get the camera all focussed and ready, tell him to "look pleasant, smile just a little, now that's good," expose your plate, and there you are. This is very simple, but when you come to get a print off that plate and show it to your friend, the chances are nine to ten that *he* will either knock you down on the spot, or *she* will tell you that if you ever show that to anyone the result will be very serious. To take a portrait that is a good likeness, graceful pose—in short, a picture in every sense of the word—is no easy task. How rare it is to find, in looking over an album, a good picture, and when you do run across one, how you admire it. A professional photographer is greatly handicapped in that he has to take everyone that comes to him (and we all know how few good subjects there are), while an amateur has free scope, can choose his subjects, conditions, &c., and should, I hold, with the same conveniences, take better pictures than the professional.

Concerning subjects, very little is to be said; as every man has his individual tastes, it would be very wrong to lay out any one line of action. Be sure and study your subject, watch his movements, his positions, and expressions, so that when you have him under the skylight you know just where you want to place him. A delay in getting ready, changing your model about in numerous positions, is almost sure to get him out of humour, and the more you change him, the less decided you will become as to where you really ought to have him. Always try to be alone; have everything quiet. Nothing is more disagreeable than to have three or four fellows standing round suggesting this or that way of doing it. I think our scheme of reserving the studio on certain hours is a capital one.

One of the first considerations of importance in portrait photography is the background of the portrait. It should be quiet—that is, entirely devoid of all objects which, by their form or colour, are conspicuous and obtrusive. We may have painted screens, decorative or very plain, but they should all be so arranged that, while they may contain many objects of interest, they are always subservient to the people placed in front of them. Where using a perfectly plain background for full-length figures, it is a good scheme to have six or seven feet of the cloth coming from the bottom of the frame in a curve to the floor. This gives a clear white effect, not showing the floor, and the abrupt ending of the background on the frame, which always detracts from the effect. In portraiture, it is particularly essential that the light should come from a point very much higher than the sitter is placed. The light striking the face on a level with it destroys those shadows under the projecting features which give character or expression, and makes a flat, weak picture; while, on the other hand, if we have our light admitted through an opening, the lower part of which is about on a level with the head, and extending to a height of 10 or 12 feet, so that the main body of light will come in at an angle of forty-five degrees or more, we will generally get the most suitable lighting to show the features to good advantage, and bring out a satisfactory likeness.

When the light is admitted over the head or from a source too nearly perpendicular, the effect produced is peculiar and generally unsatisfactory, owing to its only striking the top of the forehead, the cheek bones, and the nose, and leaving all the rest of the face in shade. The reflecting screen, used in lighting the dark or short side of the face, is better placed a little in front of the subject, at an angle to the light, and leaned over at the top a little. Care should be taken not to place it too near the sitter, especially if the plate be turned toward the screen, because, by reflecting a light into the shadow of the eyeballs, their depth will be destroyed, and an unnatural, pale-eyed appearance given.

For the production of interesting portraits, either one or the other of two classes of heads are necessary—namely, the picturesque or the beautiful. Elderly people furnish the type of the former, and ladies and children that of the latter. Old men with long hair, large features, and great beards are always fine subjects, and will bear the most vigorous lighting. In such a subject, in order to most strongly bring out the character, we should pose the head near the window, letting the light strike from high. The reflecting screen should be kept further back, so that too much light may not be reflected upon the dark side, thereby destroying that force of light and shadow which is the soul of such subjects, giving bold relief as it does, and forcing out the character. Elderly women, if intellectual and with rather large and well-formed features, make good subjects, but require to be dealt with less forcibly. When we come to deal with ladies and children, we encounter our greatest difficulties, and will find rules of the least value, often obtaining much better success by happy chance than by careful arrangement. In general, however, the lighting should be much softer in these subjects. Less light will be found better, and either lower or more diffused, which will be obtained by keeping the sitter further from the source of light. The reflecting screen now forms an important aid, and by it we must destroy those heavy shadows which, as previously said, are the soul of the picturesque, but mar the beautiful, and, while there should be light and shadow sufficient to give roundness, they must not destroy that softness and fullness which is inseparable from beauty.

In that constant effort to obtain novelty which seems now to be the fit of business, many experiments are made, and what are called tricks by artists are resorted to to catch the fancy of the unlearned and the unthinking; but while they may serve well enough for the time being the object which is sought after, they never wear so well as those works of art wherein the rules of good taste and judgment have been followed. It is rarely that a head lighted on what artists call the short side of the face, which is the side turned away from the spectator, has so good an effect as when lighted on the near or full side. The reason of this is, that lights make the impression upon the eye of advancing, while the shadows have the contrary effect of receding or retiring; consequently, when we have the further side of the face brightly illuminated, it seems to advance from its proper position, while the near side rather retires, and the result is a flattening instead of a rounding of the head. This mode of lighting also has the effect of widening a face, and, therefore, may be resorted to by photographers in some peculiar instances where such an effect is needed. Constant care should be given to the

* Abstract of a paper read at a meeting of the Photographic Society of Kansas City.

securing of a proper amount of half-lights and half-shadows. This is a matter belonging rather more to the timing of the exposure and developing of the image than the lighting. Under-exposed or under-developed plates are always lacking in half-tones. In the prints made from them one can only get high light and deep shadow, and the effect is harsh and disagreeable, and often destructive of a good likeness; and, in case of over-exposure, while the chances of a likeness are not lessened, the work, from an entire prevalence of half-tones, will be flat and uninteresting. It will be robbed of those touches of deep shadow and crisp high-lights which are so essential in the making of a good work of art. Too little exposure would only be admissible in strong character heads which we wish to be harshly and expressively set forth. With ladies and children there should be ample exposure and careful development. In fact, I think it is better to give too much rather than too little exposure, and to carry the development further than you would in landscape work. The greatest excellence to be striven after, and that most difficult of obtainment, is where the numerous relative tones are given in all their refinement of gradations, as from a black coat or velvet collar to the white collar or bosom—these being the extremes—and the entire flesh tints being upon another scale within the range of these two, possessing hundreds of fine gradations of light and dark, but none of light as the white of the linen, nor none so dark as the black in the clothes. The first quality noticeable in a bad photograph portrait is the entire absence of proper relative shades of difference throughout the work, the shadows of dark clothes, of furniture or surroundings, and of the flesh being one and the same in depth, and the lights upon the lines undistinguishable from those upon the hands and face.

Posing sitters for their portraits in respect to the most proper and agreeable disposition of the head, body, and limbs, is an exceedingly difficult part of portraiture. Even painters are seldom successful in giving a look of ease and dignity, although they are free to make any arrangement that may be best suited to their fancy, while the photographer, on account of the necessity of obviating, as far as possible, the effects of distortion by his lens, is hampered into disposing all parts, as nearly as possible, on the same plane, which adds greatly to the look of constraint. Foreshortening is an important element of the picturesque in art. To be deprived, therefore, in photographing a figure, of the benefit of having the arms or lower limbs extended towards you or receding, is a great disadvantage. When we leave the single figure and attempt groups, we are absolutely debarred from making any of those beautiful arrangements such as the old masters have left us. We must, on the contrary, adhere almost to the regularity of a company of soldiers drawn up in line for inspection. Attention now seems to be turned principally upon heads alone. In the old days, it was fashionable to give us the man or woman as they looked from head to foot; now our photographers seldom go beyond half-length, and in the case of men I think it is in better taste that we do so, for there is nothing more unmanageable than a man's legs in a pair of stiff pantaloons. With the ladies it is often easier to get good full-length pictures, on account of the greater variety of their costumes, and the interest to be derived from well-disposed drapery. In half-length poses, a more easy balance might be obtained with the figure standing instead of seated, were it not for the difficulty of keeping still. In a chair, persons are very apt to settle into a sort of a lull which is sure to destroy any look of dignity, and, if asked to sit up, are sure to get into an unnatural and forced position. There are those whose poses will always appear easy and graceful in whatever attitude they may take, but they are very rare, and one must call into play his wits and his patience to compensate as far as he can for the shortcomings of his sitters. It is a rare gift to be able to make your model feel perfectly at ease when posing for a picture, and one which we all should cultivate, for it is a most important factor for good results and graceful poses.

About retouching I will say very little, as I think very little should be done. Beyond erasing the small imperfections which appear in the skin, I do not think it good taste to do much. Sometimes, by throwing the ground glass a little out of focus, you can overcome a good many freckles, &c. A subject properly lighted should require very little retouching. Experience is the great teacher, and I think this applies especially to photography.

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

19,842. Gerhard Rodenstock, 18, Buckingham Street, Strand, London, "Improvements relating to the Adjustment of Photographic Lenses."—*November 16th.*

19,922. Dalton Thomas Miller and Albert Antoine Lateuleure, 78, Fleet Street, London, "Improvements in or connected with Automatic Photograph Machines."—*November 17th.*

19,935. Edward Griffith Brewer, 33, Chancery Lane, London, "Improvements in Photographic Apparatus." (Artidoro Farinette and the firm of Clement and Gilmer, France.)—*November 17th.*

19,978. Norton McNeil, 40, Preston New Road, Blackburn, Lancs., "A Negative Cleaning Brush for Cleaning the Backs of Negatives or other Plates or Materials used in Photographic or other Processes."—*November 18th.*

20,007. Xavier Gustave Edouard de Faucompre, 62, St. Vincent Street, Glasgow, "Improvements in or relating to Photographic Cameras."—*November 18th.*

20,068. Henry Musgrave Campbell, 37, Chancery Lane, London, "Improvements in and connected with Photographic Sensitised Plates."—*November 18th.*

20,177. John Henry Skinner, 36, Chancery Lane, London, "Improvements in Portable Photographic Cameras."—*November 20th.*

### Specifications Published.

18,410. *Nov.* 15*th*, 1890.—"Photographic Backgrounds." W. Watson, 37, Naburn Street, Glasgow.

Consists in representing, by a background having interchangeable parts, interior or exterior views of a railway carriage, tramway car, omnibus, &c. The background is made with a framework of wood, covered with cloth, and painted. There may also be used a background behind, representing a view of a station, landscape, or street, &c.

Interchangeable letters representing the name of any place, or of the car, &c., are fitted into a grooved frame fitted onto the background, instead of the letters being fitted into the background itself. They are made of metal, wood, paper, &c., having a piece projecting from the edge of that part which is in the groove, to keep them, when in place, at equal distances apart. With this invention, parties or individuals may be photographed as just going to or stepping into a train or car, or as looking out of the window, or sitting in a seat, &c.

20,972. *Dec. 23rd*, 1890.—"Carriers for Lantern Slides." R. W. JAMES, 75, Tyrwhitt Road, Brockley, and M. STODART, 35, Tyrwhitt Road, Brockley, Kent.

Consists in ejecting the lantern slides from the carrier for facilitating the manipulation of said slides when changing. On the ordinary sliding frame carrying the lantern slide is arranged an ejecting mechanism, consisting of a lever with unequal arms pivoted preferably in the lower part of the frame, the long arm of said lever reaching to about the centre of the space occupied by the slide, and the short arm being adapted to be operated by hand from the exterior, or by other means. To withdraw a slide from the frame, a small amount of finger pressure on the short arm of the lever causes the slide to be raised by the long end of the lever a considerable distance out of the top of the frame, thus enabling the operator to grip the slide by its edges, and wholly extract it from the carrier.

14,943. *Sept. 4th*, 1891.—"Photo-chromographs." L. MEYER, 3, Cornelius-Strasse, Berlin, Germany.

The object is the reproduction of paintings, pictures, &c., by photo-lithography at a less cost, and more true to the original, than by existing known processes. The picture to be reproduced is first enlarged, reduced, or reproduced by ordinary photography, and any desired number of photo-lithographs are reproduced therefrom. Each of these photo-lithographs is then illuminated with oil-colours, the outlines and the chiaroscuro being produced by the photo-lithograph. When thoroughly dry, the picture is securely transferred or fixed upon an artist's canvas with the oil-colours next to the foundation, and the paper on which the photo-lithograph was printed is then removed as in the case of ordinary transfer pictures. If a picture of high artistic finish is desired it is, after being illuminated, retouched with oil-colours by an efficient artist, so as to obtain a more harmonious blending of the various colours and shades.

## Correspondence.

### DR. MADDOX AND DRY PLATE PHOTOGRAPHY.

Sir,—Having seen that a testimonial is being raised for Dr. Maddox, chiefly on account of his connection with gelatino-bromide, and having heard also that his right to any special recognition in connection therewith was questioned in certain quarters, I thought I would form my own opinion on the matter, and the more inclined was I to do this on reading the letter which appeared in your last week's paper.

I am sorry to say I was simply overwhelmed by the results of my research. I find that early in July, 1873, Mr. Burgess startled the photographic world with a great success in emulsion. The process was acknowledged on all hands, and compliments were showered freely on him. Mr. J. Traill Taylor—surely an authority—stated that the emulsion was all its author claimed it to be, and was certainly equal to the collodion wet plate in all respects.

I find, further, that the author of the process speedily ceased to send out the emulsion, and took to making dry plates, which were also a great success. Moreover, all the authorities recognised the thing as something new, Sutton being quite enthusiastic about it, and, naturally enough, they wanted to know *exactly* how the astonishing degree of perfection had been attained. I just pause to note Mr. Pringle's sad remark that Maddox gave away what Burgess kept to himself. It seems that the inventor of the process was not willing to divulge that which he had an undoubted right to keep secret if he so willed. Or, perhaps, the facts of the case might be better represented in this way, that people wanted to have for nothing what was certainly worth paying for. Something like the following then ensued, and I may say this has amazed me beyond lmeasure.

On August 8th, 1873, after many persons had tried the emulsion, and at a time when the inventor was sending out dry plates which were highly spoken of, Mr. J. Traill Taylor complained that Mr. Burgess would not make known his methods, and intimated that they would endeavour to do so without Mr. Burgess's help by taking up Dr. Maddox's line of experimenting, and seeing if they could not attain the same results as those Mr. Burgess had obtained, promising that if anything resulted the public should be at once informed. Futher, it is stated that, as Mr. Burgess would not let it be known how he attained his results, he would have to put up with the consequences. This is beautiful in the extreme.

However, I notice that in December some one gently hinted that he considered he had waited quite long enough for the results of the experiments. I presume, therefore, that up to that time—four months after the above-mentioned scheme was concocted—the desired results had not been attained.

What can impartial persons think of all this? Comment is needless. W. W. WHISTLER, B.A.

*Sherborne St. John, Basingstoke.*

---

Sir,—Mr. Pringle says that Burgess tried to sell what Maddox gave away. Well, if that were true, it ought to end the controversy. But it is not true. Let us have a good, honest, searching look at what it was that Maddox gave away with such wonderful generosity, and contrast it with that which Burgess tried to sell.

1. Maddox made a plate which, according to his own account, required an exposure of from half-a-minute to a minute and a-half, under a negative to dull daylight, to get a print. Burgess's plates would give a print with one second's exposure to candle-light.

2. Maddox did not produce a negative at all. Burgess produced the first dry plate that ever worked quicker than wet collodion.

3. Maddox used an excess of silver and acid development. Burgess used an excess of bromide and alkaline development.

4. Maddox went on old and discredited lines, and made a distinctly retrograde movement. Burgess made an original discovery by going on lines never tried before. He washed the sensitive jelly instead of the plates, and that alone was worth thousands of pounds.

5. Maddox printed a worthless formula that no one ever noticed except his friend Taylor, and then it sank into oblivion. Burgess perfected his process, and sent the most effectual demonstration of its quality all over the world. The ready-made emulsion was sold at such a cheap rate that the poorest photographer could test it for himself, and he actually invited all the world to his house to get ocular demonstration of the value of his discovery. All the world stayed away except a few who questioned and cross-questioned the inventor, and enriched themselves with the ideas they got for nothing. One of them actually took out a patent for the very thing he saw prepared at Burgess's house.

6. Maddox's formula could not possibly help anyone, but actually put difficulties in the way. Burgess's discovery turned photography into child's play, and the vast development of amateur photography which has followed is the result of it.

7. Maddox's formula was the old, messy, finger-staining way of the dark ages. Burgess inaugurated the clean method, which a princess can practise without soiling her delicate fingers. This also, if there was nothing else, is quite enough to distinguish the one method from the other, and must have saved photographers thousands of pounds—

"And yet! and yet! the wise men say,
'Burgess tried to sell what Maddox gave away.'"

THE VICTIM.

---

Sir,—On further study of the gelatino-bromide question, I have been forcibly impressed with the necessity of remedying an unfortunate state of things. At present I would appeal to the photographic world in this matter. As every man would be glad of help were he placed in a similar position, accordingly I ask all to be willing to aid one who has been very badly overlooked, and this may be done without interfering with the success of the Maddox testimonial. The way in which they can most effectually aid is not by accepting my word, nor the words of any other man, but by an impartial study of the records themselves.

As a preliminary course, I would suggest that the numbers of the principal photographic journals issued in July and

August, 1873, should be very closely read, especially the numbers which appeared on August 8th of that year. London photographers can find all that relates to this question among a great many interesting things at the Free Library of the Patent Office, Southampton Buildings, Holborn.

In connection with this subject, I should like to ask one or two questions. Did photographers want a formula or a plate? The theorist wanted a formula, but, I take it, the photographer needed a plate.

The difficulties to be overcome by pioneers were not connected with the construction of a formula—several having been published before the worthy doctor devised his—so much as with the methods of treating the emulsion, which latter proved an insurmountable barrier to all experimentalists in this work up to 1873. In that year Burgess overcame these difficulties, and in less than a month from the time when he first sent out the emulsion which proved his success, he was actually sending out plates, the very thing photographers had long wished for.

It appears that Burgess offered to supply not only plates, but also all information respecting his processes, and the formula with which he worked. I think this ought to be particularly observed, because we hear it said that he elected to keep his process secret. The records show he did nothing of the kind. Doubtless he had a duty to perform to his family a great deal more incumbent on him than any he owed to those who demanded his formula for nothing. For all that I know, he and his family may have had to go without what some of us might regard as the common necessaries of life in order that he might have the means to pursue his investigations. Accordingly, the inventor asked a paltry guinea for the whole process, the formula being absolutely the first of practical value.

With regard to the character of the plate, it was not such as was only worthy of a place among lumber; on the contrary, it was at the very first admittedly superior to the best collodion wet plate, and ten times better than the collodion dry plate.

As the inventor insisted on his very reasonable fee, it was determined by certain persons that he should be made to suffer certain consequences, a thing, I think, no man had the right to determine. At a time when the great body of photographers was content to have the plates, and at about the same rate as that charged for the ordinary kind of to-day, at this time, viz., August 8th, 1873, the scheme was formulated by which to punish an inventor, and take away that which was most dear to him. It is certain Dr. Maddox had nothing to do with this.

In dealing with this matter, it must be remembered that we always have with us the formulæ of 1865, 1866, 1868, and 1871, together with Sutton's directions for conducting gelatino-bromide experiments, published in the *British Journal of Photography* about six weeks before the account of Dr. Maddox's experiment appeared. Any practical man can take them, make use of them, compare their results, and settle for himself how far they come short of that standard of excellence which would alone make them of value. I will venture to assert that the opinion of the practical man on Maddox's work will not be the opinion so often expressed by Maddox's friends, who have evidently never tried the experiment on Maddox's lines.

With respect to Burgess's formula, we may judge of its value by the many editorial notices and letters having reference to the success of the plates. Hundreds of people in all parts of the country had personal experience of it, and I gather from one published that the Rev. Mr. Palmer, of Liverpool, actually kept for two years one of these, the first gelatino-bromide dry plates the world ever saw, and then obtained a splendid result with it.

Now another question. If Dr. Maddox had wished to sell his formula—and he tried—what price would a practical man have offered for it? I leave practical men to reply.

When Burgess's work was seen and known, at his invitation crowds of men went to him, with the consequence that since that time the gelatino-bromide process has continually grown and flourished, a revolution having been effected in photography. J. Faulkner.

*Peckham Technical School, December 1st.*

---

Sir,—The payments and promises to Maddox fund now amount to £200. Firms, societies, and private parties are urged to lose no time in coming forward. Andrew Pringle.

---

BROMIDE PAPER.

Sir,—Will you give me space in the News to bring before manufacturers of the most sensitive bromide paper a grievance which, it seems to me, is in their power easily to rectify. It is that of being unable, in the dim light necessary for manipulating the paper, to distinguish between the two surfaces of the paper, and so having to make the exposure by guess-work on the film or plain side, as the chances happen.

I have wasted time over making wrong exposures in this way until I have become so unnerved and annoyed that I have determined upon trying to ventilate the matter. It is absurd to say the paper curls, and thus tells you the side. So it may in dry weather.

Surely a mark might be made enabling one to know whether one was exposing the right side or wrong. Bromide.

55, *Pier Road, Erith, Kent, December 2nd.*

## Proceedings of Societies.

London and Provincial Photographic Association.

*November 26th.*—Mr. W. E. Debenham in the chair.

The Maddox testimonial was the subject first taken, and the Chairman, in reply to a statement of the worthlessness of Dr. Maddox's method, which was quoted by a member from a letter recently published, said that, by the Maddox method of unwashed emulsion, he had prepared emulsion giving very good results, and although not of the rapidity of modern dry plates, more sensitive than wet collodion.

On the motion of Mr. T. E. Freshwater, seconded by Mr. P. Everitt, it was resolved that the Society as a body should join in the subscription to the proposed testimonial.

Mr. J. S. Teape showed some prints that had been highly toned with uranium and ferricyanide, and parts of which had been submitted to long washing. This proceeding had, as was generally stated, washed away all the intensity; but it had also removed a good deal of the image, and did not leave it, as stated, in the original condition. He had also tried the intensifier on platinum prints, and though the action was slow, and the change of colour not nearly so great as with bromide prints, there was a change, the image being converted to a deep chocolate brown.

The subject of the evening, "The Protection of Negatives whilst Printing," was introduced by the Chairman, who said that it was very unsafe to make even a few prints from a negative without varnishing or protection of some kind, since stains, by taking up silver from the paper, were so likely to occur. The silver in these stains was, however, in a very different condition from that of the developed image, since it might generally, when fresh, be removed by cyanide of potassium without affecting the picture. Of all methods of protecting the film, the use of spirit varnish was the most general, and unless the negative were subjected to wet, was usually found efficient. In using spirit varnish, however, the alcohol became partly evaporated by exposure to the air, and water was absorbed. The result was that, after coating many plates and returning the varnish each time to the bottle, there was too much water in the film. He had noticed that when this was the case the varnish never seemed to thoroughly harden, but would take a mark from paper pressed on it, or in other ways. Another varnish which had been recommended was composed of linseed oil and gold size. He would like to have the experience of those who had used this varnish, and to know the composition of the gold size used.

Mr. T. Bolas said that methylated spirit was often adulterated with water by the oilmen who sold it. In shellac mixtures made for other purposes, he had noticed the influence of water as mentioned by the chairman. Japanese gold size was, essentially, linseed oil in which various resins had been dissolved.

Mr. F. A. Bridge enquired whether any member had noticed a case in which the lac originally dissolved had all been deposited. This once happened with him in a bottle that had been kept closed.

Mr. J. H. Sinclair enquired as to the best varnish for celluloid films.

It was replied that spirit varnish would mark the negative if any ran over the back, and gold size varnish was recommended.

Mr. A. Haddon said that one objection to gold size varnish was that it could not be removed if desired.

Messrs. A. L. Adams, F. Simmons, and A. J. Bills were elected members of the Association.

The subject of discussion for Dec. 10th was announced as "Gas Bottles."

### Camera Club.

On November 26th Mr. A. Maskell occupied the chair.

The Rev. F. C. Lambert, M.A., gave a lecture entitled "Some Analogous Aspects of Music, Painting, and Poetry," embracing description and graphic delineation on the black board of some analogies existing in the respective derivations of music, painting, and poetry, from simple elements. The superiority of musical over graphic representatiou of some natural phenomena was argued and illustrated, and the lecturer asserted his liking for music with a motive, or, so to speak, story-telling aim running through it. Some amusing sketches were given on the board to show the power in the arts exerted by association of ideas and abstraction.

Lantern slides and musical illustrations were given of many of the points made by the lecturer. The musical examples were given vocally and on the pianoforte by Mr. Albert Joll, musical instructor at Cooper's Hill, and organist at St. George's, Campden Hill. The selections were admirably rendered in illustration of the lecturer's remarks, and greatly assisted towards the success of what was a novel and refreshing subject.

Remarks were made after the lecture by Messrs. Elder, Bartlett, and the Chairman.

Previous to the lecture, Mr. E. Calland exhibited some carbon prints on extra-rough Arnold's paper and on etching paper.

### North London Photographic Society.

*December 1st.*—Rev. E. Healy in the chair. Mr. Edward Clark was elected a member of the Society.

Questions were asked from the question box as to the mode of light measurement, and also as to a mineral oil light for optical lanterns, which would not give off a smell when burning.

On the first question a short explanation was given by the secretary. A more complete description to be given at a future date.

To the second question no answer could be given, it being generally admitted that the question of smell was largely, if not entirely, a question of cleanliness and care in using, without which all mineral oil lamps must, of necessity, be offensive.

The evening being an optical lantern night, a large number of slides were shown by the aid of the Society's lantern, under the management of Messrs. A. Mackie and B. J. Groves. The slides comprised views by the Rev. E. Healy, Messrs. Brewer, Hume, Tanner, Taverner, Douglas, and Grover. Mr. Parfitt showed the slides which were prepared by him for the recent competition at the London and Provincial Society, in which he was one of the prize winners.

On the 15th inst. a demonstration of "Carbon Printing" will be given by the secretary, Mr. W. Bishop.

### Richmond Camera Club.

The first annual dinner of the Club was held at the Greyhound Hotel on the 23rd ult. Mr. Cembrano, the president, was in the chair.

At the weekly meeting, on the 27th inst., Mr. R. L. Kidd presided, and Mr. Cembrano gave a demonstration of the making of collodio-bromide emulsions and their use for transparency work, showing and explaining the whole process of making the collodion, bromising and sensitising it, washing the emulsion, and cleaning, edging, and coating the glass. He concluded by exposing and developing some lantern slides, and explaining the method of toning them.

### Oldham Photographic Society.

*November 26th.*—Mr. Wallace Thompson, president, in the chair. Messrs. W. Lees, J. Ogden, T. Wild, and F. Wilkinson were elected members.

Mr. J. A. Furnivel, of Manchester, gave a description of "The Optical Lantern, its Construction and Use," describing in detail the manipulation of gas bottles, the construction of the mixed and blow-through jets, the optical arrangements, &c., after which he threw on the screen, by means of his lantern microscope, various interesting examples of micro-photography. He maintained that high powers could not be used in the lantern microscope without great loss of light, and that no alum trough was required to counteract the rays of heat emanating from the oxy-hydro light.

On December 17th Mr. J. W. Wade, of Manchester, will give a lecture on "Hand-camera Work, &c."

### Birmingham Photographic Society.

Annual meeting, November 26th.

The President, Mr. J. B. Stone, J.P. (chairman), in moving the adoption of the report, strongly advocated members to take up special work, and to excel in it; to increase the interest and enlist the sympathy of the public in photographic exhibitions with novelty, improvement, and advancement. He congratulated the Society on its report, and the excellent attendance at its meetings.

The officers and council to serve during the ensuing year are:—*President*—J. B. Stone, J.P.; *Vice-Presidents*—W. J. Harrison, F.G.S., E. H. Jaques, J. J. Button; *Council*—F. S. Goode, W. Jones, A. J. Leeson, A. R. Longmore, G. A. Thomason, T. Taylor, E. Underwood, G. Wilkes; *Librarian*—W. S. Horton; *Treasurer*—W. Rooke; *Secretaries*—J. T. Mousley, A. E. Tucker.

The president presented the late secretary, Mr. J. H. Pickard, with a Watson's whole-plate camera and three dark slides on behalf of the members as a souvenir of their esteem and goodwill, and in appreciation of the many services he has rendered to the Society.

Mr. Pickard, in responding, thanked the members and reviewed the history of the Society from its commencement, and, as secretary of the Photo. Survey, announced that a fine collection was being rapidly got together, and an exhibition would shortly be held.

### Bath Photographic Society.

*November 26th.*—Mr. W. Pumphrey in the chair.

Rev. E. A. Purvis discoursed on "Enlarging on Bromide Paper," illustrating his remarks by means of a Hulme Cantilever apparatus, fitted with duplex lamp. Several good examples were shown, including those made by the demonstrator, in the presence of the assembly.

Mr. Dugdale described the means he used to produce a number of large framed pictures he had with him. It was the usual daylight method.

Mr. P. Braham advocated the employment of oxy-hydrogen as a means of obtaining a sharper image than possible with oil lamps.

Mr. Austin J. King found by experience that burning magnesium ribbon did not yield satisfactory, even illumination over the whole field as had been recommended.

### Liverpool Amateur Photographic Association.

The annual meeting was held at the Law Association's Rooms, Cook Street, on November 26th, Mr. Paul Lange in the chair.

The following were elected members: Col. H. J. Robinson, Dr. Dubourg, Messrs. Frederick Clibborn, J. E. D. Parker, J. C. Still, Geo. H. Jackson, Geo. F. Allender, Percy W. Dixon, Geo. Allday, R. E. Robert, and Miss Harvey.

The hon. secretary (Mr. E. M. Tunstall) submitted a report of the Society's proceedings during the year, which stated that there was now a membership of 303.

Mr. P. H. Phillips, the hon. treasurer, presented the balance sheet, which showed that the total receipts for the year were £178 1s. 10d., against an expenditure of £173 19s. 2d.

The election of officers for the ensuing year was then proceeded with :—*President*—Mr. Wm. Tomkinson ; *Vice-Presidents*—Mr. Jos. Earp and Mr. A. Tyrer ; *Hon. Librarian*—Mr. J. Woolfall ; *Hon. Treasurer*—Mr. P. H. Phillips ; *Hon. Secretary*—Mr. F. B. Illingworth ; *Council* (to fill vacancies)—P. Lauge, H. B. Millar, F. K. Glazebrook, Dr. Keuyon, and F. Anyon.

The result of the prize competitiou was afterwards announced, and was as follows :—

| | | |
|---|---|---|
| 11 Sets of 6 prints, half-plate and under | Silver Medal | J. H. Welch |
| | Bronze „ | H. T. Mallabar |
| | Highly commended | H. Lupton |
| 5 Sets of 6 prints over half-plate | Silver Medal | T. F. Lloyd |
| | Bronze „ | H. Holt |
| 7 Sets of 2 enlargements | Silver Medal | T. B. Sutton |
| | Bronze „ | J. T. Norman Thomas |
| | Highly commended | F. B. Illingworth |
| 9 Sets of 6 pictures, hand-camera work | Bronze Medal | J. W. Swindon |
| | Commended | J. H. Ashcroft |
| 7 Sets of 6 prints not previously awarded | Bronze Medal | H. Holt |
| | Highly commended | E. A. Councell |
| | Commended | E. S. Gladstone |
| 3 Sets of Stereoscopic Slides | Bronze Medal | W. L. Elsworth |
| 22 Sets of 6 Lantern Slides | Silver Medal | F. Anyon |
| | Bronze „ | A. Tyrer |
| | Commended | T. B. Sutton. |

### Newcastle-on-Tyne and Northern Counties Photographic Association.

A selection of the 268 slides sent into the Association competition were shown before an audience of over 700 in the lecture hall of the Literary and Philosophical Society, Newcastle, on the evening of November 25th. The beautiful flower studies of Mr. J. Carpenter, London (who received one of the silver medals) were greatly admired. Messrs. G. E. Thompson's and J. W. Wade's slides were very fine, and the *genre* studies of Mr. W. J. Ankorn also call for mention. The slides sent in, on the whole, were of a high average, aud the show perhaps the fiuest ever giveu by the Association.

### Cape Town Photographic Club.

The annual meeting was held on Nov. 3rd in the club room, above Dix's Café, in Shortmarket Street, when there was a very good attendance. The chair was taken by Mr. C. Ray Woods, who stated that the president (Dr. Gill) had only just arrived from Kimberley, and would not be present. He would read the anuual report which had been drawn up by Mr. E. J. Steer, the acting hon. secretary, and which was in effect as follows. The initial meeting of the promoters of the Club was held in the St. George's Schoolroom ou October 30th, 1890. The meeting was attended by about thirty gentlemen interested in photography, and it was decided to form a club to be called the Cape Town Photographic Club. Since its formation twelve ordinary monthly meetings have been held, with an average attendance of thirteen members. An exhibition of lantern slides was held at the club room on May 5th. The usual monthly outings have been generally well attended. The committee had the pleasure of announcing that an efficient dark room, with water laid on, is now ready for the use of members. The balance sheet showed that there was a credit of £3 16s. 11d.

The meeting then proceeded to the election of office-bearers for the ensuing year, the result being as follows :—*President*—Dr. Gill ; *Secretary and Treasurer*—Mr. G. C. van Bonden ; *Committee*—Messrs. C. R. Woods, Pett, T. W. Cairncross, J. Andrews, F. Ayers, E. H. Allis, G. N. Liudup, and E. J. Steer.

During the evening a number of slides were shown by Mr. Woods, contributed by members and visitors to the Club.

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

All other Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

H. L. M. (Nottingham).—We have occasionally met with similar markings in our own practice, and believe that they are due to contamination of the fixing bath. At any rate, with us they have not put in an appearance until that stage of operations has been reached. Such markings will occur if a metal dish is used for the hypo. Use a porcelain dish, and fix with hypo freshly mixed ; if this does not cure the evil, write again.

T. P.—The process is too long to describe in this column, but you will find full details on pp. 64 aud 125 of Leaper's "Materia Photographica" (Iliffe and Son). It would be cheaper for you to buy it direct from the Platinotype Company, who sell it under the name of "red salt."

Single Fluid writes for formula of Mayfield's single-fluid transparent developer for dry plates. We do not possess it, but perhaps its compounder will reply.

Spots.—We should be inclined to suspect the alkali which you use for toning, which is notoriously of uncertaiu composition. Try some of the pure carbonate, and see whether this gets rid of the difficulty. We ourselves prefer the borax bath. It seems a pity that such very charming pictures should be blemished.

T. A. G.—Write to the Platinotype Company, Southampton Row, London, who, doubtless, will give you the information which you require.

J. W. F.—It is impossible to give you definite information on the point. More than one dealer in second-hand apparatus advertises in our columns, and to them we must refer you. A lens bearing a good name will generally fetch at least two-thirds of the list price, but, of course, this depends upon the pattern of the particular lens in question—whether it be modern or ancient in desigu.

W. R.—Au ordinary magic lantern has usually a condensing lens of not more than four inches in diameter, its mission being to illuminate a picture of about three inches diameter. It is obvious that such an instrument cannot be used to enlarge pictures of greater area. The objective, or front lens, if of the portrait type, would of course do for quick photographic work of a limited nature, but would be quite unsuitable for street scenes such as are commonly called instantaneous views. A common spectacle lens will do for a finder, and it can be used above the camera to throw an image on the upturned focussing screen. Mr. Tylar, of Birmingham, sells a cheap arrangement for the purpose.

W. T. Heal.—Wilkinson's book on zincography will tell you what you want to know ; but the knowledge so gained should be supplemented by actual practice. It is just one of those things which are full of little dodges which can only be learnt through the fingers.

West London Photographic Society.—At the meeting on the 11th December, Mr. Charters White will give a paper on "Photo-Micrography," illustrated by means of the lantern.

The Lantern Society.—At the meetiug ou December 14th, the subject introduced by Mr. E. M. Nelson will be "On Some New Forms of Lantern Condensers."

The Princess of Wales.—A screen contaiuing the photographs of the donors has been presented to the Princess of Wales at Marlborough House by some members of the Nurses Royal National Pension Fund, on the occasion of Her Royal Highness's birthday.

Photographic Society of Great Britain.—At the meeting on Tuesday next the adjourned discussion on Mr. Warnerke's paper will be takeu, and a paper will be read by Mr. A. Pringle on "Photo-Micrography." On Dec. 22nd the subject for discussiou will be "Photography by Artificial Light." Dec. 29th will be a lantern evening.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1736.—*December* 11, 1891.




CONTENTS.



## PRESSURE GAUGES.

We have recently had occasion to report a lantern disaster caused by the explosion of a gas-bag or bags—it is impossible to say whether one or both ignited—an accident which was fatal in one case, and which brought dire injury to many others. The judicial inquiry which followed this catastrophe was unsatisfactory in one respect, for the actual cause of the explosion was not made clear. The cause of explosions generally are often shrouded in mystery, because the chief actor, and the man responsible, has been among the sufferers; but in this case, happily, the operator was spared. He had apparently used every precaution in the preparation of the gas and its storage, and the jury very properly exonerated him from all blame. The occasion, however, has given experts and others an opportunity of decrying the use of bags as gas-holders, and advocating the employment of cylinders. The recommendation, perhaps, was unnecessary, for lanternists have long ago found out that the use of cylinders, besides being more convenient in every way, is actually more economical. In other words, the gas is cheaper to buy in the compressed state than it is to prepare at home, the saving of time alone being very considerable.

We unhesitatingly endorse the recommendation to use cylinders, not only by reason of their many advantages, but also because, as yet, there has been no recorded explosion of one of these gas receptacles while in use. They have certainly given way again and again under water pressure while being tested, and have also occasionally burst while being filled with gas. There is also recorded a case of an explosion of a cylinder while being experimented with, but there is reason to believe that in this case the apparatus was used in a very foolhardy and reprehensible manner. A well-tested, seamless cylinder of mild steel may be regarded as a far safer thing to work with than a bag. Under the system now adopted by the Brin Company of providing the H cylinder nozzle with a left-hand thread, so that it cannot possibly be connected with the oxygen supply pump at the works, and by giving the O cylinder a right-hand thread, so that it cannot be screwed to the H supply pump, it is evident the gases cannot be mixed, even if anyone attempted purposely to do so. But with a bag it is only too easy for an inexperienced or careless hand to mingle the two gases. The bags, for instance, may be a quarter full of gas after a performance—it is, of course, an economy to utilise that residue—and it is only too easy to fill up one of these bags with the wrong gas. It is idle to say that every precaution is taken when one bag is plainly marked with an "H" and the other with an "O," for human nature is fallible, and will make mistakes. Custom begets carelessness, and even a trustworthy man may have his attention distracted at the moment when he is filling a bag, and may make a mistake which will lead to disaster. There is, therefore, no question that, by using a steel cylinder which can only be filled by a certain machine, which machine can only be attached to the cylinder holding the particular gas which it supplies, we avoid all chance of storing an explosive mixture.

There is a danger in the use of a cylinder, but it is of another nature; it is confined to the operation of measuring the amount of gas contained therein by means of a pressure gauge. Such a form of gauge has been in use for many years for recording the pressure of steam boilers, and such an instrument forms a prominent feature of every steam engine in the country, but we have never heard of one giving way. The average working pressure of a steam boiler is something like 100 pounds on the square inch; but in dealing with gas pressures in the modern form of cylinder, we have a different condition of things altogether, for the initial pressure of the gas in a fully charged vessel as it leaves the pumping station is 120 atmospheres, equal to 1,800 pounds on the square inch. We are, indeed, here dealing with something new, a state of things never contemplated by the writers of text-books; so that it is difficult to get any information on the subject. It is not, therefore, wholly remarkable that gases under such new conditions should exhibit novel and striking properties.

But any text-book—although it will not afford the information which we are now wanting—will explain the construction of the gauge itself. The instrument is known as Bourdon's pressure gauge, and its principal part has a tube of flattened form, closed at one end, where it is attached to an axle carrying an index figure, so that any outward movement of the tube causes that index to move along a graduated arc. When a curved tube of this shape is subjected to a greater pressure on the inside than the outside, it tends to become straighter, and moves outward. When the pressure is removed it resumes its former shape.

No one suspected that there was any danger in using such a gauge until about six months ago. An operator who was testing the amount of gas in a cylinder by one of these gauges was severely injured by the bursting of the apparatus, and was able to recover heavy damages for his injuries from the firm who supplied the gauge. Other accidents of the same kind have happened since, and the most remarkable feature about them is that, although the gas in the cylinder—oxygen—is itself inflammable, at the moment of explosion a flame has been projected from the bursting gauge, and sufficient heat has been developed to fuse various parts of the metal composing it. It would seem, too, that in order to bring about one of these extraordinary explosions the gas must be at its greatest pressure. The last accident of the kind took place only a few evenings ago at the Photographic Club—happily, without serious results. The usual phenomena presented themselves, the gauge bursting with a loud noise, and flame being seen to issue from the apparatus. There was also distinct evidence that the heat developed had been sufficient to fuse the metal attachments. We are glad to see that the Club will hold an enquiry and discussion with regard to this explosion, and we hope that some satisfactory solution of the problem will be arrived at. At present the general opinion seems to be, as we indicated some months ago in dealing with this subject, that the ignition is primarily due to the presence of oil in some part of the pressure gauge, or possibly in the valve of the cylinder itself. It will be remembered that Mr. Clarkson has patented a method of charging the flattened tube of the Bourdon gauge with a semi-solid material, and furnishing the entrance to that tube with a bolt, which, should the gauge give way, will immediately stop the egress of gas, while, at the same time, the soft contents of the tube will allow the necessary expansion to take place without any risk of explosion. Before concluding our remarks upon this subject, we should advise those who are using gauges either to render them safe by the method indicated, or to abstain from testing the gases until the initial pressure has been considerably reduced.

---

Oxford Photographic Society.—On December 1st (Mr. A. Robinson in the chair), Mr. H. M. Phillipps gave a demonstration in "Autotype." The various processes were explained, and several prints were developed in sepia and black tones.

## COLOUR-PHOTOMETRY.

BY CAPTAIN ABNEY, C.B., R.E., D.C.L., F.R.S.

The following is an abstract of Captain Abney's lecture delivered last month before the Chemical Society, Sir Henry Roscoe in the chair:—

Colour has been usually made the subject of reference to empiric and variable standards, a practice which affords results useless for future reference, and only suitable for present immediate wants. What is required is a reference to numbers which are on some standard scale that can easily be reproduced.

According to the lecturer, the colour of a body, when viewed in a light of standard quality, is known when (*a*) its luminosity, (*b*) its hue, and (*c*) its purity, or the extent to which it is freed from admixture with white light, are known and expressed by numbers.

The luminosity of a colour can be given in absolute number by referring it to the standard of white. Thus, if white light fall on a coloured surface and on a surface of some standard white, the luminosity of the former may be expressed in terms of that of the light. It may appear difficult to compare the brightness of two such surfaces, but as a fact, the comparison is easily accomplished by causing the light falling on the white surface to be rapidly alternately made brighter and darker than that falling on the coloured surface. This can be done by interposing in the beam falling on the white surface rotating sectors with apertures which open and close at will during rotation. The point of equal luminosity can be found by this plan within one per cent. Experiments exemplifying the method were made, the brightness of an orange and of a blue pigment being compared with that of a zinc oxide surface which the author uses as standard white. It was also shown, by sending the beams through a trough containing water in which mucin was suspended in minute particles, that the relation only held good for the particular light in which it was measured. Hence the necessity for using a standard light. The luminosity of the light transmitted through coloured translucent bodies was also measured, and the same necessity shown for the use of a standard light.

The standard light recommended was that from the crater of the positive pole of the electric light when high illumination was required, or from a petroleum lamp when the illumination need not be so intense.

The method of measuring the luminosity of light coming through translucent bodies was also shown. A white oblong of paper was placed on a blackened card, a square which occupied half this oblong being pierced in the card, and thus half could be illuminated from the back of the card, and the other half by light from the front by placing a rod in the path of the beam to cast a shadow on the first half. The translucent substance was placed close behind the aperture in the card, and the light illuminating the paper, after passage through the translucent medium, was measured by altering the illumination of the other half lighted from the front.

The luminosity of the pure spectrum colours may be measured by what the author calls the colour patch apparatus, which is described in the *Phil. Trans.*, 1886, and in his work on "Colour Measurement and Mixture." It essentially consists of a collimator, two prisms, a lens, and a camera, on the screen of which a spectrum is brought to a focus. This screen is removed for experiments, and a collecting lens used to re-combine the spectrum, and to form an image of the last surface of the second prism on a screen some four feet off. A slide with a slit passed through the spectrum causes the white patch to become a colour patch of monochromatic light due to the particular ray traversing the spectrum slit. The white light with which the colour is compared is obtained from the light coming through the collimator and reflected from the first surface of the first prism; by means of a mirror and lens, it forms a patch equal in size to—and which can be caused to overlap—the coloured patch, or to lie alongside of it. In the first case, a rod placed in the path casts two shadows, one of which is illuminated by the colour, and the other by the white light; rotating sectors in the path of the latter allow the luminosity to be compared. The light used is the electric light, an image of the crater of the positive pole being formed on the slit of the collimator.

The luminosity of a colour is not the same when viewed from all parts of the eye. The centre of the eye is that with which observations are usually made; hence the luminosity should be measured with that part of the retina, and it is advisable that no more than six degrees of angular measure from the eye should be compared.

The audience were enabled to see the difference in luminosity of a colour which was of equal brightness to a certain white when viewed centrally, by shifting the axis of the eye so that the image was received on the retina some ten degrees away from the centre.

The action of the yellow spot was then alluded to.

The luminosity of any pigment on paper can be found by rotating it with two of the three colours—red, emerald-green, and ultramarine. These three make a grey which matches a grey formed of black and white. If the luminosity of the three have been accurately determined, by substituting the pigment whose luminosity is required for one of them, another grey can be formed to match a grey consisting of black and white. After measuring the angular aperture of the sectors, the luminosity is determined by calculation; the result is found to agree with the measurement made by the direct method. This is one of the many proofs that the measure of luminosity obtained in the manner described is correct, and not a mere accident.

The colour of a pigment can be referred to the spectrum colours by measuring the absorption. In the case of transparent bodies, this is best done by using a double-image prism at the end of the collimator so as to form two spectra on the camera screen. By adjustment, these may be caused to be so exactly one over the other that the same colour will pass through a slit in them. After emergence from the slit, the rays from the top spectrum are diverted by a right-angle prism, and caught by another which sends them through a lens on to the screen, forming a patch. Another patch as usual is formed by the rays from the bottom spectrum. By placing the transparent body in the path of one of these rays, the absorption can be measured by equalising the brightness of the patches by the sectors and noting the apertures. The absorption of pigments can be measured in the same way by causing one patch to fall on the coloured surface, and the other on the standard white.

To measure the absorption of pigments, an easy plan is to rotate black and white sectors together with variations in the amount of white, and to cause the colour patch to fall partly on them and partly on the pigment. The colour is varied till it is seen that the grey disc and the pigment reflect the same amount of light.

By both these plans templates can be cut out, which, when rotated in the spectrum, give the exact colour of the pigment on the screen; hence this is a reduction of the true colour to absolute numbers, since the colour can be reproduced from a reference to a note-book. It is to be remarked that the measures are unaffected by any defect in the eye of the observer, or by the kind of light in which they were effected.

The mixture in varying proportions of red, green, and violet of the spectrum makes white. This was shown by placing three slits in standard positions in the spectrum, and altering their apertures till a match was made with a patch of white light alongside.

Any other colour can be matched by the mixture of the same three colours, as was shown in matching green, blue, and brown papers.

Since three colours will make white, and the same three colours will make a match with an impure colour, every colour in nature can evidently be matched by mixing not more than two of these colours with a certain proportion of white light; and if these colours be red and green, or green and violet, the colour can be matched by one spectrum colour and white light, since there is some intermediate colour which has the same hue as the mixture of these two colours. Hence any colour, except purple, can be referred to some spectrum colour, together with a certain proportion of white light. In the case of purple, the colour may be expressed as white light from which the complementary colour is eliminated. Hence, any colour whatever may be expressed in terms of white light and one spectrum colour, the latter in wave-lengths, and the former in percentage of luminosity.

This was shown to be the case by interposing between the silvered mirror which reflected the light coming from the first prism, and which formed the white comparison patch, a plain glass mirror which reflected a small percentage of the light on to the colour patch, the amount of which could be regulated by sectors. Brown paper was placed in the white patch, and the spectrum colour was changed and mixed with the white light till the same colour was obtained. The scale of the instrument told the wave-length, and, by interposing a rod in the path of beams, the proportional luminosities of the spectrum colour and of the white light were determined. A similar match was made by light going through signal-green glass, and the complementary colour of the light passing through permanganate was determined.

Light coming through properly-picked specimens of red, blue, and green glass, and overlapping, may also be made to match a colour. The three glasses covered a square lens, and formed an image on a screen of a circular patch of white light coming through ground-glass on a screen. Colours were placed on a white beam alongside, and, by altering the amount of the coloured glasses exposed, matches were made.

If the dominant wave-lengths of the colour of these three glasses be known, and also the amount of white light mixed with it, these measures can be noted in terms of these three glasses; and, further, it is possible, by mixing the light coming through the three glasses in various proportions, to obtain a spectrum colour mixed with white light for each such mixture. Hence this is a substitute for the spectrum itself. To show this, three similar glasses were placed over apertures suitably cut in a circular card, and, by causing these to rotate in front of an illuminated slit, a sham spectrum was thrown on the screen in which every colour was present.

Any colour can be reproduced with three rotating sectors of red, green, and blue when certain proportions of white or black, or both, are mixed with one or other. If the dominant wave-lengths and the proportion of white light mixed are known of each such colour, the pigment whose colour is to be determined can be expressed in numbers as before, and in terms of spectrum colours if desired. This was shown by matching brown paper with red, blue, and green, a little white and black being mixed with the brown.

The importance of using some uniform light was insisted upon throughout, slight deviations in the experiments demonstrating this.

In conclusion, Captain Abney claimed to have demonstrated that the reference of colour to numbers was not only possible, but easy, and that—to chemists especially—the application was one of almost capital importance. Everyone could do it, and the lecturer had an instrument on the stocks which was not so cumbersome as that shown, but which would answer all purposes, he hoped, when complete.

## RODINAL.

We have recently had an opportunity of trying this new developer, and find that it fully bears out the statements made with regard to it in a recent issue of the Photographic News. It will be remembered that rodinal is an extremely concentrated solution of paramidophenol, and that a company has been formed in Berlin to introduce it to public notice. The preparation is carefully made, and its use will save all trouble of compounding. With normal exposures it is diluted for use with thirty times its bulk of water, while for greater contrasts a more concentrated solution is employed. It works more slowly and gives more delicate gradations if mixed with forty parts of water, so that it will be seen that its action can be controlled by simple addition of water.

In cases of over-exposure, an old solution should be used, or some bromide may be added to the freshly-prepared solution. For bromide paper development, rodinal is diluted with from 100 to 200 parts of water. The ordinary hypo bath can be used for fixing, but an acidulated bath gives the best results. Fixation somewhat weakens the image, so that in the case of both plates and paper the deposit should be somewhat darker than it is intended to be when finished. The wholesale agents for this country are Messrs. R. W. Greeff and Co., of 29, Mincing Lane, E.C.

Mr. Oscar Scholzig, of Dashwood House, 9, New Broad Street, E.C., has sent us samples of Zirkenbach's plain and graduated woollen background cloths, which are in various tints, and are admirably adapted for their purpose. The material is eight feet in width, and the price is moderate. These woollen backgrounds have many advantages over painted cloths, for they are softer, lighter, do not crease or crack, and can be easily cleaned when soiled by long use. Mr. Scholzig is also agent for the Dresden Art Furniture Company's goods, and he has sent us a marvellous catalogue of the different studio accessories made by that firm. We use the word "marvellous" because the catalogue is illustrated by nearly two hundred full-page collotype reproductions from photographs, and in this respect is a unique volume. The expense of its production must have been great, but the enterprise of its promoters will surely be rewarded in good time, for the pictures give a most realistic idea of the value of the goods illustrated.

## PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Rodinal Developer—New Printing Papers—Toning Collodio-Chloride Prints—Hand-Camera "Minor"—Salted Paper with a Resinous Emulsion.

*Rodinal Developer.*—It becomes more and more evident that the new rodinal developer is a reducing agent of eminent qualities. Dr. Miethe has compared it with the well-known rapid hydroquinone developer recommended by Professor Lainer, and, by employing in his experiments a sensitometer, in order to obtain results as exact as possible, he found that the rodinal developer, even when it was diluted to fifty times its bulk with water, was equal to the hydroquinone developer as regards energy, with the simple difference that the rodinal produced a much greater density in the under-exposed parts of the sensitometer plates than the hydroquinone developer. With regard to the keeping qualities of the rodinal, the author found that if the concentrated solution was diluted with ordinary water, a bright yellow liquid was obtained which, if kept in an open glass measure, acquired from an orange to a reddish-brown colour after the lapse of two days; at the same time, small crystals and a yellow, flaky deposit were precipitated. The same alteration took place a little sooner if the solution was kept in an open dish. The energy of the solution diminished, however, comparatively soon. All the plates developed with rodinal showed the utmost clearness, together with a beautiful colour of the silver deposit. In the case of over-exposure, it will be better to use an old solution instead of potassium bromide, since the latter shows a tendency to produce harsh negatives. If, in this case, the necessary density cannot be obtained, to each 100 c.c. of the developer 5 c.c. of a solution of—

| | |
|---|---|
| Hydroquinone ... ... ... | 5 grammes |
| Water... ... ... ... ... | 100 c.c. |
| Sulphite of soda ... ... ... | 10 grammes |

may be added. Even in the case of greatly over-exposed plates, clear glass and very vigorous negatives will be obtained, showing a beautiful greyish-black tone.

*Two New Printing Papers.*—C. V. Zamboni gives in the *Phot. Notizen* a description of two new printing papers introduced recently by the firm of Bruno, Saenger, & Co., of St. Petersburg, under the names of argentotype paper and velox paper. These papers, which give prints with a beautiful matt surface, differ only in the tone of the finished prints obtained on them, the argentotype paper giving an intense black similar to platinotype prints, the velox paper from a warm violet to a sepia tone. The manipulations are very simple. The paper is placed (in subdued light) on the negative with its prepared yellow surface, and exposed in the printing frame until the image is visible in all its outlines. The print is then placed with its back on the bottom of a dish which is covered with a little water, and allowed to remain until the image has been fully developed. Care should be taken that none of the water comes into contact with the film side of the paper, which would tend to the formation of spots. The print is then drained between blotting-paper, and dried over a spirit flame. After drying, the film side of the paper is moistened with as little water as possible, in order to dissolve out the soluble salts of the preparation. The water is allowed to act for about ten minutes, when it should be poured off, and the print washed thoroughly in two or three changes of water. It is then placed for five minutes in a solution of hyposulphite of soda 1 : 1,000, again washed two or three times in clean water, drained between blotting-paper, and finally dried over a lamp. If desirable, the prints may be toned before fixing, or treated with the combined toning and fixing bath as used for aristotypes.

*Toning Collodio-Chloride Prints.*—According to H. Wandrowsky, collodio-chloride prints are advantageously treated with the following combined toning and fixing bath :—

*Solution* A.

| | |
|---|---|
| Water ... ... ... ... | 700 c.c. |
| Hyposulphite of soda ... ... | 200 grammes |
| Sulphocyanide of ammonium ... | 20 ,, |
| Acetate of lead ... ... ... | 10 ,, |

*Solution* B.

| | |
|---|---|
| Water ... ... ... ... | 300 c.c. |
| Alum ... ... ... ... | 5 grammes |
| Citric acid ... ... ... ... | 5 ,, |
| Nitrate of lead ... ... ... | 10 ,, |

(This solution becomes milky.)

The two solutions are mixed, and after strips of unfixed silvered paper (about one-fourth of a sheet) have been added, they are allowed to stand for twenty-four hours. After the mixture has been filtered, 30 c.c. of a solution of chloride of gold 1 : 100 are added slowly and by shaking the bottle. The prints are placed in this bath with the film side down, without being previously washed, all the air-bubbles which may be formed being carefully removed. The prints become at first yellow, their vigour becoming greatly reduced; soon, however, the tone changes into a sepia colour, and then into brown, purple-brown, violet, blue, bluish-black, intensely black, and finally grey. The tone which the print shows on removing it from the bath will be retained after drying. The above-given quantity of the bath will be sufficient to tone and fix twenty-five sheets of 50 by 60 centimetres of collodion paper; after about ten sheets have been treated with it, a solution of 100 grammes of hypo in 200 c.c. of water should be added to it.

*Hand-Camera "Minor."*—The *ne plus ultra* of smallness and lightness in hand-camera work is a photographic detective camera recently introduced by the firm of Dressler and Heinemann, of Munich (Bavaria), under the name of "Minor." It is not much larger than a starch box, and its weight amounts only to 120 grammes. The pictures obtained with it are of the size of 4 by 4 centimetres; and being sufficiently sharp, may be enlarged afterwards. The camera is provided with a view-finder, and with three small metal plate-holders. The setting up and releasing of the shutter is very simple, and may be imperceptibly done. For many purposes this small camera will be very convenient.

*New Method of Producing Salted Paper with a Resinous Emulsion.*—Salted paper, giving prints of from brownish to platinum black tones, is prepared by E. Valenta in the following way. 10 grammes of ammonium chloride are dissolved in 100 c.c. of water; on the other hand, from 3 to 4 grammes of gelatine are allowed to swell in water, and, at the same time, from 3 to 4 grammes of very finely powdered light yellow French colophony are saponified with ammonia. This is done best by bringing water in a porcelain dish up to the boiling point, adding to it a little ammonia, and stirring the colophony gradually into the liquid. The clear resin-soap solution is then mixed with the swelled gelatine, and, after the latter has dissolved, the ammonium chloride solution is added. Distilled or rain water is added up to 1,000 c.c., and the solution carefully neutralised with diluted hydrochloric acid, and finally a concentrated solution of citric acid in water is added until the solution shows a distinctly acid reaction. A milky solution is obtained in this manner, which is employed in the preparation of the paper. Rives plain paper is recommended by the author for this purpose. It should be moistened by means of a sponge with the warm solution, and then floated for about three minutes upon the warm liquid. It is then hung up in a warm room to dry. To sensitise the paper, a ten or twelve per cent. solution of silver nitrate in water should be used, on which the paper is floated for two or three minutes. The paper is dried in a dark room, and may then be used for printing; but it will be better to fume it, previous to printing, in the well-known manner for about ten minutes, since it will then print quicker and yield more brilliant prints. If the paper, after printing, is soaked for a short time in water, and then fixed in a ten per cent. solution of hypo which has been acidulated by means of sodium bisulphite, prints will be obtained of an agreeable reddish-brown tone. The image will not be sunk in, as in the case of the ordinary salted paper, but it will show brilliancy and clear whites. To obtain black tones, the prints are at first placed in a bath of 0·3 gramme of chloride of gold, 8 grammes of borax, and 1,000 c.c. of water, and allowed to remain until they have acquired an intensely dark violet tone by transmitted light. They are then rinsed with water, and placed in a bath consisting of 1 gramme of potassium chloro-platinite, 300 c.c. of water, and from 15 to 20 drops of nitric acid. In this bath they acquire soon a black colour, which, after fixing, washing, and drying, renders them very similar to platinotypes. If the prints are fixed directly after toning, they obtain a very agreeable reddish-black colour; if an acid bath of uranium nitrate is employed instead of the gold bath, the prints acquire a decided red-chalk tone.

## THE MEASUREMENT OF LENSES.

A paper on this subject was read in the theatre of the Society of Arts on Thursday, the 26th ult., by Professor Silvanus P. Thompson. The lecturer commenced his remarks with a regret that the resources at the disposal of the Technical College, Finsbury, did not enable its staff to organise and equip a proper laboratory for optical measurements, and for the standardising of optical instruments, in the same thorough and practical way in which they have now for more than ten years organised laboratories for electrical measurements. What Professor Ayrton did ten years back for the City and Guilds Institute, in organising a laboratory for electrical measurements, he had desired to do for optical measurement, believing that, when the opportunity should come, the work would be of as much benefit to the optical industries of London as the electrical laboratories of the City and Guilds Institute have been.

An optical laboratory should possess the means of testing rapidly, accurately, and without too expensive appliances, such matters as the truth of plane surfaces, the curvature of curved ones, the focal powers of lenses, their aberrations, and their aperture. It should have means of testing mirrors and prisms, as well as actual entire instruments. It should be able to state the results in terms available for future years by the employment of accurate fundamental standards.

With but one very small part of the subject of the work of the optical laboratory could the lecturer deal on the present occasiou, namely, with the measurement of lenses. Lenses are used for many different purposes, and in varied functions and combinations. Measurements that would be important for some of these are utterly unimportant for others. For example, the condenser lenses used for magic lanterns are not wanted to be either aplanatic, achromatic, or rectilinear; their function being merely to collect the light which emanates from a certain luminous patch, and spread it as nearly equally as possible over the area covered by the transparent slide, so that the whole is equally illuminated, and so that the light so transmitted shall be on the whole slightly convergent. To measure the aberrations or exact focal powers of such lenses would be a useless work.

Enumerating all the things which might be made the subject of measurement with respect to a lens or combination of lenses, they are found to be no fewer than eighteen in number:—

(1) Diameter, or linear aperture; (2) thickness, or length from pole to pole; (3) focal power, or its reciprocal, the focal length; (4) position of principal focal planes; (5) position of optical centres ("principal points" of Gauss); (6) angular aperture; (7) chromatic aberration; (8) spherical aberrations, lateral and longitudinal: (9) chromatic difference of the spherical aberration; (10) loss of light by reflection from surfaces; (11) absorption of light in transmission; (12) illumination of field, central and marginal; (13) complaneity of focus (included in 7 and 8); (14) degree of distortion of image (rectilinearity); (15) cylindricity, or degree of astigmatism, including angle of axis of cylindricity; (16) accuracy of centreing; (17) definition in margin of field (involved in 7, 8, and 16); (18) refractive indices of materials.

Of these the lecturer dealt ouly with three, namely, the focal power of lenses, and the position of their focal planes and principal points.

The subject was treated exhaustively, and was illustrated by copious examples. We regret that we cannot print the paper *in extenso*, but as it has appeared in the *Journal of the Society of Arts*, our readers will have an opporunity of studying it to their very great profit.

Royal Institution.—The following are the lecture arrangements before Easter:—Prof. John G. McKendrick, 6 Christmas lectures to juveniles on "Life in Motion, or the Animal Machine"; Prof. Victor Horsley, 12 lectures on "The Structure and Functions of the Nervous System (the Brain)"; Mr. A. S. Murray, 3 lectures on "Some Aspects of Greek Sculpture in Relief"; Prof. E. Ray Lankester, 3 lectures on "Some Recent Biological Discoveries"; Prof. W. P. Ker, 3 lectures on "The Progress of Romance in the Middle Ages"; Dr. B. Arthur Whitelegge, 3 lectures on "Epidemic Waves"; Prof. J. A. Fleming, 3 lectures on "The Induction Coil and Transformer"; Lord Rayleigh, 6 lectures on "Matter: at Rest and in Motion"; Prof. J. F. Bridge, 3 lectures on "Dramatic Music, from Shakespeare to Dryden (the Play, the Masque, and the Opera)," with illustrations. The Friday evening meetings will begin on January 22nd, when a discourse will be given by Lord Rayleigh on "The Composition of Water"; succeeding discourses will probably be given by Sir George Douglas, Prof. Roberts-Austen, C.B., Mr. G. J. Symonds, Prof. Percy F. Frankland, Sir David Salomons, Prof. L. C. Miall, Prof. Oliver Lodge, Mr. George du Maurier, Mr. John Evans, Mr. F. T. Piggott, Prof. W. E. Ayrton, and other gentlemen.

## RENOVATING THE CAMERA.

BY H. C. STANDAGE.

Now that the autumn touring is ended, the camera and accessories are more or less dilapidated in appearance, the polish on the wood-work is dull and scratched, the brass-work shows signs of rough wear and tear, the leather bellows is shabby and stained, and altogether the whole apparatus looks, metaphorically speaking, not worth an old song. Nevertheless, the apparent shabbiness is not beyond the skill of the photographic operator. The renovation and re-polishing or varnishing of the wooden framework is simple enough to those who know how; the relacquering of the brass-work is easy to perform; while the leather bellows, the interior of the camera, and whatever other portion is out of repair, can be cheaply and perfectly renovated and made as good as new by very simple means.

As we have already hinted, the question crops up, "How to set about these repairs?" In this article I purpose giving simple, practical, and full directions for renovating the camera and its accessories, and making them look like new.

As a further development of the subject of this article, I hope later to deal with the renovating of the studio and its appliances, but for the present only the camera itself is considered.

*Re-polishing the Camera and its Stand.*—After repeated exposure to wind and weather, the bright polish of the wooden framework will invariably show signs of wear. If the brightness of the polish is but slightly dulled, and in no way scratched, its brightness can be restored by simply sponging it over with a mixture of $\frac{7}{8}$ linseed oil, and $\frac{1}{8}$ rosemary oil, all grease, &c., having been previously washed off with a flannel and a little warm soap and water. But for our purpose we will suppose a more serious state of affairs, namely, that the polish is weather-worn and scratched, that the lacquer of the brass-work is abraded and cankerous, the bellows out of repair, the blackness of the interior greatly worn off, and the whole article sadly in need of repairs; too much so to be renovated by mere patching up; nothing less than a thorough overhauling will make the article spick aud span. Therefore, proceed as follows. Remove all brass-work that permits removal, and then thoroughly wash off all grease, and as much of the polish or varnish as will come off, by means of soap, soda, water, and a flannel; a few drops of caustic soda put in the water will facilitate the removal of the polish, the object of its removal being to get down to the wood pure and simple. Scraping off the polish with a scraper will not be successfully performed by an amateur, owing to the many intricate parts to be dealt with, and unless the polish is uniformly removed the appearance will be patchy. When the polishing is done, give a whole day to dry in a warm room, so as to dry all moisture out of the wood-work, then give a coating of clear size, applied by means of a sponge. A little of Caunon's concentrated size dissolved in warm water in a basin will answer well. The wood-work will only need sizing if it is to be varnished instead of polished, and then only if the old polish is so far removed as to leave the wood porous.

If polishing is to be resorted to, no further preparation will be necessary after the washing with soap and water, as the pores will be sufficiently filled up to ueed no wood-filler to prevent the absorption of the polish. The method of applying the polish is to make a tuft of cotton-wool into a pad about 1¼ in. across; when covered over tightly with a piece of old, clean linen, this pad is held between the thumb and two fingers of the right hand, and, after partially saturating with polish, the wood is rubbed therewith in a circular sweep of the hand, or series of interlacing O's. Select a few inches surface, and persistently rub this in the above manner until it shines like a piece of glass or porcelain; then proceed to an adjoining portion. To prevent any mark appearing at the point of junction, keep the edges always moist by an occasional rub over them with the polishing pad. Do not smear the pad with polish, but, with the bottle in the left hand, give it a shake, place the pad to the mouth, and turn the bottle of polish upside down for a second; sufficient polish will adhere to the pad for use. If too much be taken on the pad at one time it will dry thereon, and become hard, and thus render the pad useless; and if too much polish be applied to the wood, it will form a thick, sticky layer that will refuse to become polished at all. When the pad becomes worn out or hard, use a fresh one; it is preferable to use a fresh pad on an unpolished portion of the wood to using a new pad on a portion already partially polished. A small bottle of pure linseed oil should be kept handy, and an occasional moistening of the pad with this will prevent the pad becoming hard and unmanageable. No pressure whatever is required in using the pad, but mere persistence in rubbing over the portion in hand until it glistens like a porcelain surface. The following formulæ will enable the operator to select and prepare his own polishes.

*Formulæ for Various Polishes for Wood.*—The following formula may be used for dark woods, such as walnut and mahogany:—

| | |
|---|---|
| Ruby shellac ... ... ... ... | 10 parts |
| Spirits of wine ... ... ... ... | 40 ,, |

Digest the lac in the spirit in a corked bottle with frequent shaking. When all is dissolved, the polish is ready for use.

*Formula for Superior Mahogany Polish.*—17½ ounces of the finest shellac are dissolved in 35 ounces of alcohol of the greatest strength (96 per cent.) by means of a water-bath.

*Formula for Dark Coloured Polish.*—In 70 ounces of 96 per cent. alcohol, dissolve 10½ ounces of ruby shellac and $2\frac{1}{10}$ ounces of Venetian turpentine. Place blotting-paper in a funnel, and filter the mixture through the paper, placing a plate over the top of the funnel to prevent evaporation of the spirit, which would render the polish too thick.

*Formula for Colourless Polish.*—The following preparation is for light woods, such as maple, ash, boxwood, &c.:—10 parts of shellac completely bleached are dissolved by slow digestion in 45 to 50 parts of spirits of wine.

*Formula for French Polish.*—Powder 4⅓ ounces of the finest shellac, and put it into a glass vessel with 26 ounces of strong alcohol, and dissolve by the heat of a sand-bath. In a separate vessel dissolve 1 ounce of dragon's-blood in 26 ounces of alcohol by digestion and shaking. When both mixtures are fluid, pour them together, and then add 7·7 grains of turmeric. Well shake the mixture, and allow it to stand undisturbed for twenty-four hours, and then filter through cotton-wool or cloth filter.

The above formulæ will be sufficient in the present case. Should the camera be a cheap one, the labour of polishing is not commensurate with its value. In such case, a coat of varnish meets all wants. To lay on such a coat, all that is needed is to pour a little varnish into a saucer, and, using a flat varnish brush, lay it on in strokes first one way, and then transverse or at right-angles—that is, do not use the brush up and down like a paint-brush—and avoid going over the same portion twice. Do not have the brush loaded with varnish, nor too empty, but, having dipped it well into the varnish, draw the flat side against the edge of the saucer to rub off superfluous varnish. The temperature of the room when varnishing should be from 70° to 75° F., and this temperature should be maintained until the coating is hard and dry—*i.e.*, no longer tacky. At the same time, avoid all dust and draughts, as a sudden chill will cause the varnish to bloom—*i.e.*, become opalescent instead of bright and clear.

*Formulæ for Ordinary Spirit Varnishes for Wood.*

| | | |
|---|---|---|
| 1.— | Sandarac resin ... ... ... ... | 40 parts |
| | Venetian turpentine ... ... ... | 4 ,, |
| | Spirits of wine ... ... ... ... | 120 ,, |
| 2.— | Sandarac resin ... ... ... ... | 24 parts |
| | Venetian turpentine ... ... ... | 2 ,, |
| | Mastic resin ... ... ... ... | 16 ,, |
| | Spirits of wine (96 per cent.) ... ... | 120 ,, |

Digest, and shake at intervals until the resins are dissolved.

| | | |
|---|---|---|
| 3.— | Sandarac resin ... ... ... ... | 48 parts |
| | Venetian turpentine ... ... ... | 1 part |
| | Mastic resin ... ... ... ... | 24 parts |
| | Spirits of wine ... ... ... ... | 120 ,, |

Digest as before.

The solution of the sandarac resin is facilitated by heat, therefore a sand-bath or water-bath is worth using when the varnish is wanted in a hurry.

*Formula for Red Wood Lacquer.*—The word lacquer is more generally applied to spirit varnishes used for metals, but essentially it is applicable to all spirit varnishes in which lac is an ingredient. In 50 parts of spirits of wine digest 1 part dragon's-blood, 2 parts elemi, 2 parts mastic, 8 parts sandarac, 4 parts shellac, and 4 parts Venetian turpentine.

*Formula for Black Wood Lacquer.*—In 20 parts of spirits of wine digest 1 part elemi, 1 part seed lac, 1 part mastic, 1 part sandarac, 2 parts shellac, and 1 part Venetian turpentine. To give the black colour to the lacquer, rub up 1 part of bone-black in the turpentine before adding the latter.

Before commencing the polishing or varnishing operations, it will be best to coat all brass-work with a thick layer of white of egg, so that, should the metal become accidentally smeared with polish or varnish, the smear can be easily removed by means of warm water and a sponge. Another caution is this; carefully remove all the old lacquer off the metal-work by means of a strong solution of soda with a few drops of sodic hydrate added.

*Formula for Lacquers for Brass-work and other Metals.*—All the metal-work that could be removed before varnishing the wooden frame should be cleansed of old tarnished lacquer by the following means. Boil a strong ley of wood ashes, add a small quantity of soap leys; put in the brass-work, and let it remain in for a short time, when the lacquer will be removed. Take it out, and dip each article in *aqua fortis* sufficiently dilute to take off the dirt, wash in water, dry well, and apply the lacquer.

*(To be continued.)*

---

We have received and put to the test a packet of the new chloride paper issued by the Ilford Company. It gives first-rate prints full of vigour, and necessitates no great care in manipulation. It is likely to prove a boon to photographers, especially in this dull season of the year, and it has the merit of being as cheap as it is good.

## Notes.

Some months ago, a great many complaints were made of certain firms who advertised that they would make enlarged photographs for nothing. These apparently guileless advertisers issued a very clever circular, stating that they were so anxious to bring their work before the British public that they had arranged to supply portraits worth £2 free of charge; and the sole condition they made was, that the picture should be suitably framed. In their circular they made no mention of the little fact that the frame was to be supplied by themselves, and that it was to be purchased at a price far in excess of its actual worth. One or two persons were sharp enough to insist upon the advertisers carrying out their agreement, and actually recovered damages for non-fulfilment of that agreement. One would have thought that these knock-down blows would have at once stopped this miserable game, but we find that circulars worded in much the same way are still being issued. Strangely enough, several of these circulars have lately been sent to well-known gentlemen connected with the photographic press, so that the advertisers are evidently not quite so "cute" as they fancy themselves to be.

The non-technical newspaper reporter is not happy when he is explaining to the public that of which he has no knowledge himself, and it is certainly creditable to him that he is able to screen himself so well behind a mass of magnificent verbiage. The recent gas-bag explosion at Ilkeston gave him a chance in this direction, and some wonderful statements with regard to the general behaviour of gases were accordingly given to the world. The most inexplicable of these we clip from a provincial paper, and fancy that it must have been evolved in the fertile brain of Mrs. Malaprop herself. Certainly we defy anyone else to explain its exact meaning. We are told that one of the dangers attending a lantern entertainment arises in the following manner: "The tubes of oxygen gas used may be not sufficiently strong for their purpose, owing to the oxygen being placed in mistake in a tube intended to contain another gas." We imagine that a man who could write this could mix gases or anything else, and we sincerely trust that nothing serious will happen to him.

All those who are interested in the modern method of zincographic engraving, which has replaced the work of the wood engraver to such a wonderful extent, will be interested in studying the supplement to the Christmas number of the *Graphic*. This sheet gives a number of clever sketches which have appeared in the *Daily Graphic*, and in addition to this there is a short article with the title "How it is done." Here we have a complete record of the method by which a block is produced, with a statement of the time occupied by each of the operations involved. Thus, we begin with the artist, who, accompanied by the ready writer, makes his sketches; then we are shown how the drawing is photographed by the electric light, then how the zinco plate is etched; and finally, how the block, associated with its descriptive type, is stereotyped; and lastly, how the newspaper is printed off on a rapid rotary machine. The illustrations shown are reduced from original drawings which have appeared in the *Daily Graphic;* they are full of life and vigour, and form an admirable example of the manner in which photography has benefited modern journalism.

It was only natural that the recent eclipse of the moon should form the chief subject of discussion at the last meeting of the Royal Astronomical Society. Unfortunately, no one had much to say, for, as Mr. Maunder remarked, at Greenwich they were always unfortunate. About ten o'clock the moon was just seen for a moment—long enough to bring the dozen observers who were appointed to watch it up to their posts—and then the clouds rolled together again, and everything was hidden. As the optical observations were so brief, photographic observations were, of course, out of the question. Later on in the evening a paper by Lieut. Molesworth was read, suggesting the employment of photography as a means of testing the existence of a lunar atmosphere. The suggestion elicited an opinion from the president (Capt. W. Noble) to the effect that he did not believe either photography or any other method of observation could reveal the existence of any atmosphere on the moon.

An inspection of a good number of this season's Christmas cards reveals the fact that photographic cards have gone greatly out of favour. We are not surprised at this. The photographic cards introduced some seven years ago were too large in size, and far too heavy in design and treatment. They consisted almost entirely of flowers photographed on a flat surface, and the prints coloured. The shadows were far too obtrusive, and the colours were muddy. The qualities best liked in a Christmas card are lightness of design and delicacy of treatment; and we should fancy that small snow scenes would find a ready sale. They certainly would be more appropriate than summer flowers in full bloom.

When you are engaged in hazardous enterprises, it is perhaps as well not to be too free with your photographs. A Capt. Dawson, who has achieved an unenviable notoriety through taking a party of Transvaal miners to Madagascar to work a mining concession which, he asserted, he had obtained from the Malagasy Government, unwisely gave his photograph to one of the miners as a passport to the Sakalava chief who owned the land. The photograph did not have the desired effect, and Capt. Dawson, leaving the miners to shift for themselves, made all haste to quit the island. The photograph which was to have such wonderful diplomatic powers afterwards fell into the hands of the *Madagascar News*, which has reproduced it as a supplement, with an intimation to the readers to "hang this up for reference." Madagascar, by the way, is moving with the times. In the same paper is a really creditable litho reproduction of a photograph of a group of miners, drawn by Razaka, a native artist.

An enterprising Paris photographer has taken time by the forelock by anticipating one of the advantages of photography in natural colours when this much-discussed problem is solved and has a practical outcome. The photographer in question puts forward the following fascinating advertisement: "Madame, who has perhaps wished that the *nuances* of colour in her fair hair and charming toilet might be fixed for ever, may now be immortalised in all colours for a modest sum." The "system" adopted by this enterprising gentleman has not been made known, nor does it much matter. His advertisement is almost good enough to secure him a reputation.

## LEEDS INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

BY OUR SPECIAL COMMISSIONER.

Leeds is certainly not a beautiful town; but, as I sat looking out of the window of the hotel, its importance to the well-being of the country generally was striking enough. The rain was coming down in a manner to astonish even a Londoner, and that is saying something. At nine o'clock in the morning of the Press view day the sky was black, and the downpour of rain was not water, but ink, which careered in torrents down the channels and gulleys of the streets; but, in spite of all this sable misery, the streets teemed with drenched humanity, mostly female, evidently hurrying off to commence the daily labour of the week. Each one carried what might be called a regulation wicker basket—the pattern was so exactly the same in every case—and contained, in nearly every case, not only food for the day done up in newspaper, but a pamphlet of the penny novelette stamp as well, thus providing food for the mind as well as the body at the mid-day meal. Two-storied steam trams were tearing along in every direction, and, in addition to 'buses nearly as plentiful as in London, the busy street was almost impassable for wheeled traffic of the heaviest kind, which made the spot more like Lower Thames Street than any other place I have ever seen. I think the buildings are more begrimed with soot than those of any other town in the kingdom; certainly London is not in the inky competition, and need not try to win.

Leeds has reason, however, to be proud of two buildings, the Town Hall, and the Municipal Art Gallery, which is now the home of the Leeds Photographic Exhibition. I cannot speak of the Liverpool Exhibition, for I did not go; but for splendid surroundings and perfectly-lit galleries Leeds has the advantage over Glasgow, and that is saying something. Leeds has reason to be proud of its permanent Art Gallery, for it contains some celebrated modern pictures, several of these being the gift of Col. Harding, who, besides being the chairman of the Municipal Fine Arts Committee, has been a most zealous worker for the success of this Photographic Exhibition. When it is remembered that any surplus will go to the purchase of works of art to do honour to the town of Leeds, one cannot help wishing the joint committee, who have worked so well in bringing together such a splendid collection of works representative of the photographic art of to-day, a big financial success.

Fortunately for the welfare of the *conversazione*, the rain, which had in the most workmanlike manner done its best to mar everything, rested from its labours about six in the evening, evidently exhausted. At eight the approaches to the main entrance were blocked with carriages, and on entering one could not fail to be struck with the brilliance of the scene. Electric light everywhere to give due effect to the gay, and in some cases splendid, dresses of the fair sex. Exotics lined the approaches—of course I mean plants, and not tender specimens of Eve's fair progeny—and the band of the Leeds Rifles—a magnificent band, by the way—had commenced its labours in the court below. The balconies which looked down on this open space were filled by the fair sex, who, programme in hand, were partly listening, and, in some cases—must it be said?—partly, or rather wholly, flirting.

The Mayor briefly opened the proceedings in the large gallery, and introduced Col. Harding, who referred to the early history of photography, and the prominent part taken by Leeds forty years ago in helping on its progress, and referred to the fact that Mr. Ramsden, one of the most zealous workers of that period, was still amongst them, as hale and hearty and as enthusiastic as ever. He then called upon Mr. J. Gale to give his illustrated lecture entitled "Rambles: Rural and Pastoral." The artistic quality of Mr. Gale's lantern slides is known pretty well by this time; but they were new to the Leeds folk, who were simply delighted with them. The lecture was divided into two parts, and the interval of half-an-hour was filled up by the delightful music of the band.

The Leeds Photographic Society is very justly proud of its distinctive position as the first photographic society in England. The members claim more, and say the first in the world. Probably it is so; at any rate, there is no occasion to disprove the assertion. One thing is quite clear: the date of formation was 1852, and this date gives them a start of a year over the Photographic Society of Great Britain.

I could scarcely grasp the fact that the owner of the grand leonine head and giant form which towered over the heads of many, and who answered to the name of Ramsden, was the same man—and as energetic as ever—who made collodion well-known to many of the readers of this journal more than thirty years ago. Leeds has reason to be proud of Ramsden, for the collection of early work shown by him and others was exhibited at the first exhibition held in England in 1853. Not only are there large prints made about this time, and in a wonderful state of preservation, but, most interesting of all, and instructive as well, the original waxed paper negatives are there as perfect as ever. In talking to me about these, Mr. Ramsden said, "We have not got so very far after all, for in those days I could carry twenty prepared pieces of paper weighing less than a glass negative in one slide, and take them out one after the other as they were exposed, almost in the open air, for we had not to be careful about the light in those days." This need not surprise modern workers if they bear in mind that the exposure was about half-an-hour! One of the pictures exhibited is a calotype negative, taken nearly fifty years ago with a spectacle glass fixed in a cigar box. Last year was exhibited at Pall Mall a large photograph and the spectacle glass employed to produce it, side by side in the same frame. Where are we now? Waxed paper negatives appear to have been a speciality with the early members of the Leeds Photographic Society, for a large proportion of these early pictures are done by this process. It must be remembered that these are not merely paper negatives waxed afterwards; but prepared by a distinct method known as the waxed paper process, in contradistinction to the usual method, usually called Talbotype or calotype. Let any one examine Ramsden's early waxed paper negatives, and compare them with Eastman paper films as first exhibited in this country, and he will be astonished to find how slight is the difference. There is an early portrait of Robert Hunt, to whom photographers owe much—how much they will find if they chance to pick up at a cheap rate, as I did by good luck the other day, "Hunt's Researches on Light." Daguerreotype portraits of old mayors of Leeds, by Huggon, deserve most careful examination, but there is evidently an error about the dates. They begin with Sir George Goodman, 1836, and terminate with H. C. Marshall, 1842. Now, Huggon worked under

Beard's patent, who had it from Daguerre in 1839, who, by the way, did not let out that he had sold exclusive rights for England when he accepted the pension of 12,000 crowns from the French Government—in order, as Arago said in grandiloquent style, that the process might be as free as the light that produced these marvels. Poor England with its fogs was shut out from this great privilege. Undoubtedly Daguerre was a great man (of business). I shall have more to say next week about the photographs of to-day, but I would advise all who have the opportunity to devote themselves to a most careful scrutiny of what may now be considered old-world marvels of photography.

Awards.

*Open to Professionals Only.*—Class 1—Portraits, whole-plate and over, W. M. Warneuke, silver medal; W. W. Winter, bronze. Class 2—Portraits, under whole-plate, Harold Baker, silver; John E. Shaw, bronze. Class 3—Enlargement portraits, H. J. Van der Weyde, silver; Alexauder Bros., bronze. Class 4—Enlargement other than portraits, F. W. Edwards, bronze.

*Open to Amateurs Only.*—Class 5—Portrait set, Clarence B. Moore, bronze medal. Class 6—Portraits under whole-plate, W. J. Jenkins, bronze. Class 7—Portrait enlargement, S. H. Barton, bronze. Class 8—Enlargement other than portrait, J. W. Wade, silver. Lantern slides, J. E. Austin, silver; W. Tavener, bronze; B. Gay Wilkinson, bronze.

*Open to Professionals and Amateurs.*—Class 9—Landscape, whole-plate and over, John E. Austin, silver medal; J. E. Gibson, bronze; F. M. Sutcliffe, bronze; W. C. Beetham (two pictures), special silver. Class 10—Landscape, under whole-plate, Karl Greger, silver; P. Ennis, bronze. Class 11—Marine and clouds, F. M. Sutcliffe, silver; A. R. Dresser, bronze. Class 12—Animal studies, Karl Greger, silver; Jean Halle, bronze. Class 13—Out-door groups, Karl Greger, silver; F. M. Sutcliffe, bronze. Class 14—Architectural interior and exterior, whole-plate aud over, F. W. Edwards, silver; C. Court Cole, bronze. Class 15—Architecture, interior and exterior (under whole-plate), Wm. Denham, bronze. Class 17—Flash-light, John Stuart, silver. Class 18—Instantaneous, general subjects, Lyddell Sawyer, bronze. Class 19—Instantaneous, yachts in motion, Sweet and Kinlock, bronze; W. C. Beetham, bronze. Class 20—W. D. Welford, bronze; J. M. Nicholsou, bronze; Percy Lewis, bronze. Class 21—Instantaneous, other than seaside and marine, Major Lysaght, bronze. Class 22—*Genre*, C. Smerdon Roe, silver; Lyddell Sawyer, bronze; Adam Diston, bronze. Class 23—Microscopic, R. Kidston, bronze. Class 25—Scientific, Cecil V. Shadbolt, bronze. Class 26—Transparencies, F. W. Edwards, silver; J. W. Wade, bronze. Class 27—Lantern slides (amateur), J. E. Austin, silver; W. Taverner, bronze; B. G. Wilkinson, bronze. Lantern slides (professional), G. West and Sons, silver; G. E. Thompson, bronze.

*Photo-Mechanical.*—Class 28—Photogravure, line subjects, W. L. Colls, bronze medal. Class 29—Photogravure, half-liue subjects, The Autotype Company, silver; T. and R. Annan and Sons, bronze. Class 31—Type-high process, R. Gardner and Company, silver. Class 34—Woodburytype, Waterlow & Sons (Limited), bronze; S. B. Bolas & Company, bronze. Class 37—Photo-chromograph, Waterlow & Sons (Limited), silver; Photochrome Engraving Company, bronze.

*Champion Class.*—William Crooke, gold medal.

Special gold medal to H. J. Van der Weyde, for the Misses Dene; special silver medal to Prince Ruffo, for two heads; special commendation to the Leeds Photographic Society, for lantern slide exhibits.

Leeds Photographic Society.

In addition to the medals offered by the Fine Art Gallery Committee, the Committee of the Leeds Photographic Society have offered special medals for competition among its own members, which have been awarded as follows:—

Lantern slides—Godfrey Bingley, bronze medal; Herbert Deuisou, brouze. Laudscape (set)—Godfrey Bingley, brouze; Beddgelert, Godfrey Bingley, silver. Figure—William Wright, bronze. Architecture—William Denham, bronze. Instantaneous—A. A. Pearson, bronze. Enlargements—S. A. Warburtou, bronze. Special brouze medal to C. E. Spencer for portraits.

## ALLOTROPIC SILVER.

Professor Meldola's views with regard to this subject are commented upon as follows by Mr. M. Carey Lea in a recent issue of the *Chemical News*:—

In a recently published lecture, Mr. Meldola seems to call in question the existence of allotropic silver. This opinon does not appear, however, to be based on any adequate study of the subject, but to be somewhat conjectural iu its uature. No experimental support of any sort is given, and the only argument offered (if such it can be called) is, that this altered form of silver is analagous to that of metals whose properties have been greatly changed by being *alloyed* with small quantities of other metals. Does, then, Mr. Meldola suppose that a silver alloy can be formed by precipitating silver in the presence of another metal from an aqueous solutiou, or that one can argue from alloys, which are solutions, to molecular compounds or lakes? Moreover, he has overlooked the fact that allotropic silver can be obtained in the absence of any metal with which silver is capable of combining, as in the case of its formation by the action of soda and dextrine. Silver cannot be alloyed with sodium.

Mr. Meldola cites Prange as having shown that allotropic silver obtained with the aid of ferrous citrate contains traces of iron, a fact which was published by me several years earlier, with an analytical determination of the amount of iron found. Mr. Prange repeated and confirmed this fact of the presence of iron (in this particular case), and my other observations generally, and was fully convinced of the existence of both soluble and insoluble allotropic silver. Mr. Meldola's quotation of Mr. Prange would not convey this impression to the reader.

Of the many forms of allotropic silver, two of the best marked are the blue and the yellow.

Blue allotropic silver is formed in many reactions with the aid of many wholly different reagents. To suppose that each of these many substances is capable of uniting in minute quantity with silver to produce in all cases an identical result, the same product with identical colour and properties, would be an absurdity.

Gold-coloured allotropic silver in thin films is converted by the slightest pressure to normal silver. A glass rod drawn over it with a gentle pressure leaves a grey line behind it of ordinary silver. If the film is then plunged into solutiou of potassium ferricyanide, it becomes red or blue, whilst the lines traced show by their different reaction that they consist of ordinary silver. Heat, electricity, and contact with strong acids produce a similar change to ordinary grey silver.

These reactions afford the clearest proof that the silver is in an allotropic form. To account for them on suppositions like Mr. Meldola's would involve an exceedingly forced interpretation, such as no one who carefully repeated my work could possibly entertain.

Writing to the *Chemical News* on this subject, Prof. Meldola remarks:—

My attention has just been directed to the communication on this subject by Mr. Carey Lea, called forth by some remarks of mine in the Cantor Lectures delivered last spring before the Society of Arts. I should be extremely sorry if Mr. Carey Lea imagines—as would appear from the tone of his communication—that I desired in any way to detract from the value of his most interesting observations. He is labouring under a complete misapprehensiou if he supposes I intended to call in question the existence of the coloured compounds or modifications of silver with which he has made us familiar. He is, moreover, inaccurate in stating that my strictures were not based on any "adequate study of the subject," and that "no experimental support of any sort is given." If he will do me the favour of turning to the lectures in question, he will find that my statement was: "After carefully considering the conditions of formation, *and after repeating some of the experiments*, I must say that there appears to me to be no sufficient evidence that these coloured forms consist of the pure metal. On the contrary, all the evidence goes to show that some impurity is present," &c. I may add that, following Mr. Carey Lea's instructions, I have not had the slightest difficulty in preparing the gold-coloured product; with the soluble or colloidal silver I have not been so successful. I freely confess, however, that my experiments have not been numerous in this direction; but, since other investigators have succeeded in preparing the "soluble silver," I must attribute my own failure to hurried work, or to some violation of Mr. Carey Lea's instructions. I may state, also, that I am not singular in this failure to produce the "soluble" form, as several other and more experienced operators have met with the same negative results. Mr. Carey Lea would be conferring a boon upon large numbers of chemists in this country, who are interested in his work, if he would favour us with more explicit instructions.

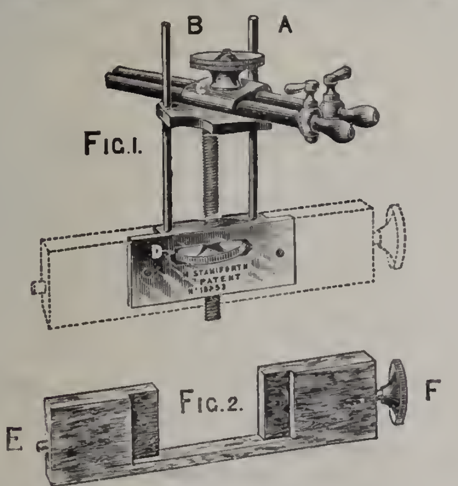
The facts are, that Mr. Carey Lea, by reducing silver salts, under certain conditions, has produced certain coloured products which contain a large percentage of silver and a small percentage of other substances. None of the evidence goes beyond this—not even the most recent contribution to the subject by Schneider, which appears in the number of the *Berichte* just received. One of these products is soluble in water.

Now, I never called in question the existence of these compounds; I did not even bring forward my own and other experimenters' failures as negative evidence. I only thought it right to caution my audience against applying the term "allotropic silver" to these products. I venture to reiterate that caution now in the hope that Mr. Carey Lea will admit its justice. Allotropy I understand to denote "the appearance of *one and the same substance* (italics mine) in several different states, distinguished from each other by different properties" (Watt's Dictionary, Morley and Muir, vol. i., page 128). How, then, can we apply this term to products which have not yet been shown to be "one and the same substance," viz., silver?

If Mr. Carey Lea will prepare specimens of his gold-coloured silver or colloidal silver possessing all the properties of these substances, and containing 100 per cent. of silver, I will admit the applicability of his term. In the meantime, I consider the designation "allotropic silver" to be premature, and apt to mislead. In other words, I must remain, and I think other chemists will remain with me, in the same position as that which I felt it necessary to take in the Cantor Lectures.

## NEW LANTERN ATTACHMENT.

The old-fashioned method of attaching a lime jet to an




optical lantern is by means of a vertical rod which springs from the hinder part of the tray. The method is unsatisfactory, for the jet is liable to shift, nor is it the easiest thing in the world to adjust the luminous spot to the exact optical centre of the instrument. Hence several improved methods have been brought forward within recent years, some of which involve considerable weight and complexity in construction. The most recent is that invented and patented by Mr. H. Staniforth, of Sheffield, which is here illustrated. This form of "jet-holder and regulator," as it is called, can be fixed to any existing lantern, and it dispenses with the usual iron tray entirely, for it is attached to the wooden casing of the lantern itself. The jet is held firmly under the clamping screw, A (fig. 1), which also admits of its being fixed at the required distance from the condensing lens, when it can be raised or lowered by turning the milled wheel D with the finger. Fig. 2 shows the manner in which the jet-holder can be adapted to single lanterns by means of a piece of wood to which it is fixed. E is a peg at one end of the arrangement, and F a fixed screw at the other, by which the fixture can be brought about without difficulty.

## Short Notices of Books.

The Studio, and what to do in it. By H. P. Robinson. (*London: Piper and Carter.*)

This is a book which has, deservedly, such a rapid sale that a fresh issue is constantly being found necessary. We earnestly wish that all photographic aspirants would furnish themselves with a copy of the work, for it answers questions which we are constantly being asked, and answers them, too, far more fully than can be done in the pages of a periodical. We have here chapters on the merits of various forms of studios, on backgrounds, accessories, methods of lighting the sitter, on pose and management of the subject, and upon many other topics too numerous to mention. When Mr. Robinson takes up his pen he writes about what he knows from practical experience, and the reader quickly feels that he is in the hands of a most competent guide. The book is a very cheap half-crown's worth.

Hazell's Annual for 1892. (*London: Hazell, Watson, and Viney.*)

This is not a photographic work, we are thankful to say, for a conscientious review of such a vast mass of matter would mean many days' work. But all the same, the wonderful volume deserves a word of praise even in a photographic journal, for there is no branch of art, science, or trade which cannot benefit by reference to its pages, which number nearly one thousand. This is the seventh year of issue, and each annual volume is an improvement on its predecessor.

The British Journal Photographic Almanac for 1892. Edited by J. Traill Taylor. (*London: H. Greenwood and Co.*)

It speaks well for the popularity of photography when we find that this well-known annual has swollen to its present dimensions. The name of the editor is sufficient guarantee that it is compiled with care, and that it is well up to date.

Brixton and Clapham Camera Club.—A reception will be held on the 12th inst., to inaugurate the opening of the new quarters at the Clarence Rooms, 376, Cold Harbour Lane, Brixton. Visitors invited.

## Patent Intelligence.

*Specially compiled for the* Photographic News *by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of* 18, *Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

20,302. Franz Wiese, 62, St. Vincent Street, Glasgow, "Collapsible Background for Photographic and other Purposes."—*November 23rd.*

20,489. William Tylar, 12, Cherry Street, Birmingham, "Improvements in Camera Boxes for Microscopic Photography."—*November 25th.*

20,557. Thomas Henry Powell, 116, Denmark Hill, London, "An Improvement in the Method of, and Materials or Compound employed in, Toning Photographic Prints on Paper, Glass, or other Surfaces."—*November 26th.*

20,600. Raphael Kopp, 45, Southampton Buildings, London, "Improvements relating to Photography in Natural Colours."—*November 26th.*

20,690. Julius Hauff, 166, Fleet Street, London, "The Use of Aromatic Amido Compounds and of Derivatives of Pyrogallol for the Development of Photographic Images."—*November 27th.*

### Specifications Published.

1,736. *January 30th,* 1891.—"Developers for Photographic Pictures." O. Imray (The Actien Gesellschaft für Anilin Fabrikation, Berlin, Germany).

Relates to the development of photographic pictures by means of para-amidophenol and para-amidocresol, or their chlorine, bromine, iodine, oxy and amido derivatives, or the carbonic and sulphonic acids of para-amidophenol and para-amidocresol, by the use of which an exceedingly rapid and energetic development is effected, so that these substances are especially applicable for developing plates after short exposures. As an example of the preparation of a stock solution: 30 grammes of metabisulphate of potash and 10 grammes of hydrochloride of para-amidophenol are dissolved in 100 grammes of distilled water. To this solution concentrated caustic alkali is slowly added until the precipitate which is at first formed has become dissolved again. The above proportions may be varied, and for the metabisulphate of potash may be substituted bisulphate of soda or sulphite of soda.

16,608. *November 7th,* 1891.—"Photographic Albums."—P. Oster, Koln-Richl, Germany.

Cousists in an album in which the photographs can be easily inserted into and removed from the spaces designed for their reception without the possibility of injury to the album.

The leaves or sheets are divided in the middle; the three external rims of these leaves are solid, while the fourth rim is provided with a slot situated between the front and back of the leaves, and projecting somewhat into the external rims, by means of which the photograph can be inserted and immovably held tight, the said guide slot being closed by a closing-piece inserted into the lower cover of the album.

## Correspondence.

### BROMIDE PAPER.

Sir,—The letter of "Bromide" in your issue of the 4th inst. has caused some merriment iu my enlarging department. What would become of those who make a business of enlarging if, as "Bromide" says, "exposures were made by guess-work on the film or plain side, as the chances happen"?

For his guidance, permit me to say that the coated side may be distinguished from the uncoated side by (1) a slight inward curling of the edges—though "this is absurd"; (2) by slightly moistening one corner, when the gelatiue becomes adhesive; (3) by placiug the edge of the paper between the teeth and gently biting it; the teeth separate freely from the *un*coated side, but adhere slightly to the coated side, and separate with a peculiar noise which is soon recognised; (4) by the mere sense of touch, which is soon acquired by those who thoughtfully and carefully use "large quantities."

But "Bromide" need not worry himself; let him send his enlarging work or bromide contracts to one of my *confrères*, or to— J. Martin.

*General Photographic Works, New Southgate, N., December 5th.*

Sir,—Replying to "Bromide's" suggestion that bromide paper should be marked to show which is the sensitive side, I think this would add considerably to the trouble involved in its production, and hence probably to its cost, as it is so frequently sent out in cut pieces of small size, and every piece would need to be marked separately. I use a good deal of this material, and never experience any difficulty in distinguishing which is the right side. My method is to slightly moisten the tip of my little finger, and touch the extreme corner. The sensitised gelatine will adhere perceptibly, while the other side quite fails to do so. I do not find this touch leave any mark to speak of, and if it did, being at the very corner it could be easily trimmed off. Lignum Viride.

### CHARLES WILLIAM SCHEELE.

Sir,—In connection with the early history of photography, it may interest some of your readers—as a link between the very earliest investigators and the present time—to reproduce the following circumstauces. "Yesterday, Sunday, 6th December, died at Newcastle-on-Tyne, aged 73, Charles William Scheele, a resident there for fifty years, a worthy citizen, after only four days' illuess. Congestion of the lungs."

The following paragraph, taken from the introductory remarks in the catalogue of the Liverpool Photographic Exhibition of 1891, explains itself, and I venture to ask you to give it to your readers:—"We come now to 1777, and to a brilliant genius, Charles William Scheele, of Stralsund, in Swedish Pomerania; he was a distinguished investigator, and must be considered as one of the founders of modern chemistry. He made the first scientific investigation of the behaviour of silver chloride under the influence of light. First he noticed the action of differently coloured light, that the silver salt was quickly darkened by violet or blue, then that red or yellow rays had much less effect; but Scheele also discovered the cause. These technical particulars I need not enter on; it is, however, the first leading principle of all photographic discovery. Scheele really obtained the first photograph ever produced by fixing a glass prism in his window, and allowing the refracted sunbeams to fall on paper prepared with a salt of silver. In performing his experiment, Scheele had no idea of the uses to which his discoveries have since been applied in the formation of photography. His sole idea was to demonstrate a principle existing in light. As a connecting link between this historical period and the present, a lineal descendaut of Charles William Scheele, of Stralsund, bearing the same name in full, has been resident in Newcastle-on-Tyne for nearly half a century. He was also born in Stralsund, and is also engaged in the chemical industry. Two of his daughters are married, and resident in Cheshire."

*Liverpool, 7th December.* Thomas S. Mayne.

### DR. MADDOX AND MR. BURGESS.

Sir,—Probably most readers of the News see that those who are taking the side adverse to Dr. Maddox in this matter are bringing into discussion points that were never raised by the advocates of Dr. Maddox. The question is not whether the process of Dr. Maddox was a better one thau those which followed—than that of Mr. Burgess, for instance—but rather whether the process of Dr. Maddox was or was not the first which gave practical results. Of course his process was the first so far as history tells us. If it is to be a question of who introduced the process of to-day, then Mr. Burgess may climb down at once iu favour of Mr. Bennett. We all admit that the process of Mr. Burgess was a better one than that of Dr. Maddox in several points, just as we all know that that of Mr. Bennett was a great advance on that of Mr. Burgess.

I would join issue with Mr. Burgess on several of the assertions made in his letter to you in your issue of December 4th; but I prefer to leave mere wrangling alone, and to put before your readers the main issue. I see no harm in Mr. Burgess having tried to make money out of his process; only I submit that, if ever there should be an appeal for acknowledgment of his invention, this commercial step of his would completely bar all such appeals as we are now making for Dr. Maddox.

I would call attention to definite statements made by Mr. W. E. Debenham at the London and Provincial Association. He stated that Dr. Maddox's process consisted of bromide and silver in gelatine, and yielded *negatives* "very much of the same character as those produced now-a-days, though without such rapidity." He, the speaker, had made plates and got good negatives with more rapidity than wet collodion, by Dr. Maddox's process, modified by himself. I appreciate the impartial and judicial tone of the letters of the two gentlemen who have contributed to the literature of this subject in your correspondence, but I have not time to follow them, especially as my first sentence of this letter seems to cover their arguments.

I take it that it is Mr. Burgess who signs himself "The Victim," and I cannot repress my regret that he has introduced into this discussion the emetical couplet which concludes his letter. ANDREW PRINGLE.

P.S.—I may say that already our subscription list includes the names of many of the very oldest and ablest photographers in this country, the men most likely to know where the real credit lies.

---

SIR,—I wish to call the attention of your readers to the fact that a history of the gelatino-bromide question has been compiled, which demonstrates very clearly the relative positions of experimentalists.

It has been accepted for publication, and steps will be taken to bring it to the notice of all who have been asked to believe that "Dr. Maddox has done more for gelatino-bromide than any other man." A casual glance at the history will soon upset the theory that "every photographer knows that this important discovery is due to the experiments of Dr. Maddox."

Those who care to form some idea of the line which has been taken, may do so by hunting up the following references. Those up to and including January 19th, 1866, are to be found in the PHOTOGRAPHIC NEWS; those from April 27th, 1866, being in the *British Journal of Photography*. November 17th, 1865; November 24th, 1865; December 22nd, 1865; December 29th, 1865; January 5th, 1866 (notes by "An Old Photographer"); January 19th, 1866; April 27th, 1866; January 21st, 1868; July 11th, 1871; September 8th, 1871; July 25th, 1873; August 1st, August 8th, August 15th, (Burgess's challenge and substitute for collodion on last page); August 22nd, September 5th, September 26th, October 3rd, October 17th, October 24th, October 31st (a most important letter from John Beattie, of Bristol), November 7th, on which date we have a proclamation of boycotting.

During the whole of which time no claim is made on behalf of Dr. Maddox, nor did anyone think anything of his experiment, except that it was of no use. J. FAULKNER.

*Peckham Technical School.*

---

SIR,—Without wishing to say anything against the claims of Dr. Maddox or Mr. Burgess, might I enquire why Mr. Charles Bennett has been so entirely overlooked? Until the time when he so kindly gave to us the benefits of his experiments, gelatino-bromide plates were of very little practical value, and had it not been for the publication of his valuable formulæ, I doubt not we should still have been devotees of the now almost forgotten wet process, and the dry-plate factories not yet dreamt of. At any rate, Mr. Bennett has the warmest thanks of at least one—

5, *Pollet Street, Guernsey, Dec. 7th.* PROFESSIONAL.

---

OUR readers will be interested to learn that the scheme for reproducing and publishing the scores of great composers by permanent photographic process, which some time back was suggested by Sir George Grove, has now assumed definite shape, and that a firm of musical publishers at Berlin, under the auspices of the Beethoven Society there, are about to issue a volume of that composer's immortal symphonies and concertos. Further issues of a like kind will subsequently appear should the speculation receive the support from music lovers which it undoubtedly deserves.

## Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

*December 3rd.*—Mr. J. B. B. WELLINGTON in the chair.

It was decided to have an entertainment, partly scientific and partly musical, and the 18th of February was settled on for the date; it would be made a special ladies' night.

Mr. A. HADDON mentioned that Mr. J. S. Teape had, at the last meeting, shown some prints from which the image had almost disappeared in consequence of their having been subjected first to the uranium intensifying process, and then to long washing. He had then pointed out that, the silver being still on the film, it should be capable of being made evident by re-development, and this had proved to be the case. He had first brushed over one of the prints with a solution of bromide; he had then re-developed with hydroquinone, and obtained a full image. This he had re-converted into bromide, and again re-developed with oxalate; again re-converted, and developed with eikonogen; and finally re-converted, and developed with pyro. The image was now probably as vigorous as it was before the print had been subjected to the uranium and reduced by washing.

The CHAIRMAN enquired in what form was the silver when in the invisible state.

Mr. HADDON replied that it was probably ferrocyanide.

The CHAIRMAN suggested that, instead of re-converting the image into bromide, a chloride might be formed. The image re-developed would then probably be of a different tone.

Mr. TEAPE showed a set of examples cut from a bromide print; one was in the original condition; a second had been toned with uranium; a third had been reduced to an almost invisible state by subsequent washing; and the remainder had been converted into chloride and bromide and re-developed with different agents.

Mr. B. SMITH mentioned the case of an image bleached with chlorine water and then re-developed.

Mr. A. MACKIE remembered with collodion to have fixed an exposed plate, and then with acid pyro had developed an image.

Mr. DEBENHAM enquired whether for this experiment it was necessary to expose longer than would suffice if the image were to be developed in the usual way. If ordinary exposure, as for an image to be developed, sufficed in this case, it was an argument supporting the chemical theory of the latent image.

Mr. T. BOLAS, using ordinary bromide emulsion, and giving ordinary exposure, and fixing until there was nothing visible, had obtained very good results by after-treatment with pyro and silver, and often used the method in preference to the customary one.

Mr. HADDON showed a print which had been an ordinary gelatino-bromide one, but had been converted into a blue print by treatment with ferricyanide, and subsequently with iron in the ferric state.

Mr. DEBENHAM presumed that the image now consisted of Prussian blue and the original silver, which might be expected to darken in time.

Mr. HADDON replied that that was so.

A question from the box was read enquiring whether any one had been able to confirm the experiment described by Mr. Friese Green, wherein the human eye was made to impress upon a gelatine plate an image of a flash or electric light which had previously been looked at.

Mr. HADDON said that he had tried and utterly failed. It was curious that, amongst the hundreds of thousands who must have heard of the experiment, no one had come forward to verify it.

Mr. P. EVERITT read a paper on the "Exaggerated Perspective of Wide-Angle Lenses."

Mr. A. COWAN took exception to the title of the paper, which, he said, assumed that which was denied, and suggested "Asserted exaggerated perspective" as a more proper title.

In the course of the paper, Mr. EVERITT said that he considered the angle common in painting, of from 45° to 60°, as ordinary. More than this he should call wide, and narrower than this narrow-angle. He contended that the argument recently put forth in favour of the truth of perspective as given by wide-angle lenses was not just, because, although if the point of sight of the picture were looked at directly the marginal objects might assume the form shown in the photograph, they were in such case quite indistinct to the eye, on account of their falling on a part of the retina that did not give good definition, and when the eye was directed to that part of the picture they no longer gave any true impression, but showed the distortion which existed. Then, again, linear perspective was not perfect, but only approximate, as we looked at a thing with two eyes, and linear perspective recognised monocular vision only. Artists had the privilege of reproducing a scene as from any desired distance, which photographers had not.

Mr. T. Bolas said that, although artists did frequently limit themselves to narrow angles, that was not always the case. In the Wiertz collection there were pictures which included a wider angle than any lens would give. In these a globular object towards the margin became elongated to several times its width, but seen from a proper point—to indicate which an eyehole was placed—they took the correct form. In the ordinary gallery picture, which would be looked at from a different point for each part of the subject, the artist commonly made a compromise, and painted what would not be true as seen from any one point.

Mr. Debenham said that Mr. Everitt was mistaken in supposing that the point of sight must be looked at in order that the mathematical or photographic representation of objects at the margin of the picture should appear true. It sufficed for the eye to be in the right position, and then it might be directed to any part of the picture. He thought that Mr. Everitt was not entitled to speak for artists universally, when putting forward the view that they acted in defiance of mathematical perspective. Many doubtless did, some from not having thoroughly gone into the subject, and some from a desire not to shock the prejudices of a public unwilling to recognise the truth of representations other than those to which they had been accustomed. The text-books recognised by the authorities of the Science and Art Department at South Kensington taught mathematical perspective as rigorously as photography demonstrated it, and the public would doubtless, in time, appreciate it—as, indeed, was more and more the case. He thought the introduction of the question of binocular perspective only tended to mystify matters. He thought that those who said that photography was incorrect from representing things as seen with one eye only should be bound to say what was the difference which, they asserted, should be made from the drawing, as given by a photograph, to meet their views. He had thrown down this challenge before, but could meet with no response. Would they say that objects in any given part of a picture should be broader, narrower, longer, or shorter than shown in a photograph? If unable to answer this, let them not confuse the matter by dragging in the subject. Then, again, as to the asserted distortion by photography (or mathematical perspective) of marginal objects; let those who asserted this bring forward a scheme of perspective which will answer for any class of subject. They would find that mathematical perspective was not only true, but the only possible perspective which would give objects in their true relative proportions as seen from any given standpoint, and the picture looked at from that standpoint presented no distortion, but a representation of nature so exact that, if placed in front of the scene, and the picture removed bit by bit, there would be seen, as each portion, however small, of the picture was removed, the original object represented on the removed piece.

Mr. Beckett said that the method of demonstration used in the art schools, where a drawing was made on a pane of glass of objects as seen through it, was of the same kind as that suggested by Mr. Debenham's last remarks, and gave, unquestionably, a true result.

Mr. W. Dando (who was elected a member earlier in the evening) illustrated the apparent distortion in a painting as corrected by selection of point of view, and showed how, in theatrical scene painting, the matter was taken into account.

Mr. Everitt replied generally, and said that what he objected to was the pedantic application of perspective.

### Camera Club.

On Monday, November 30th, Mr. Frank Haes exhibited his slides illustrating what was done in animal photography in the days of wet collodion. The slides were from negatives made twenty-seven years ago.

After Mr. Haes' pictures, other slides were shown by Messrs. Davis, Hughes, Bolton, Burchett, Greene, Budger, Walker, Laurie, and Major Becher.

On Thursday, December 3rd, Mr. Dresser read a paper on "Toning Rough Bromide Paper and Transparencies," and gave different formulæ for mercurial and for uranium toning, referring to a large number of his own examples which were arranged on the Club walls.

Mr. Herbert Fry afterwards gave a demonstration of the toning process, and Mr. Weir Brown added much information and showed some instructive illustrations.

On December 17th Mr. Leon Warnerke will give a description and demonstration of his "Simplified Collographic Process."

### Holborn Camera Club.

*December 4th.* — Mr. Herbert Thompson in the chair. Messrs. Daw and Gunn were elected members.

Mr. F. J. Cobb then opened a discussion on "Enlarging." He thought that the reason why so few amateurs had taken up with enlarging was because they thought it required expensive apparatus. All the enlarging he had done was by means of apparatus costing not four or five guineas, but four or five shillings. When he first started enlarging, about three or four years ago, he knew next to nothing about the subject, and he had to gain his knowledge by experience. His apparatus consisted of an old 10 by 8 camera, to which he had fixed a baseboard with an easel at the other end, the negative to be enlarged being placed in the dark slide of the camera. He covered the apparatus up by means of a hood, and exposed with magnesium ribbon. The distance of the light from the negative would depend on the density of the negative. He had a silver print by his side while exposing, so as to tell which part of the negative would require most light, and which required shading. That was one of the chief difficulties. The negative itself should be thin. He first used a portrait lens, but could not make it answer, and he finally used a single lens. He used the ferrous oxalate developer; he had tried hydrokinone, but he did not like it so well. When he first started he always obtained very black and white results, instead of the grey tone which he wished to obtain. He now left out the bromide of potassium, using Eastman's paper, to obtain the desired results. In conclusion, he advised beginners to stick to the same negative until they obtained a good print. They would by that means know what to do with the next negative to be enlarged.

Mr. E. H. Bayston gave a description of the method of daylight enlarging.

Mr. E. Benest said he did not recommend anyone to use the iron developer, because of the great difficulty of getting rid of the iron in the paper, which, if left in the print, would cause it to fade. He had tested prints which had been developed by the iron developer, and had been through three separate clearing baths and well washed, and found iron still existed in the paper.

Messrs. Brocas and Golding and other members also took part in the discussion.

### North London Photographic Society.

In the report of this Society's meeting furnished last week, it was omitted to be stated that, in connection with the optical lantern, Mr. A. Mackie exhibited a series of slides illustrating the results of a number of experiments made by him to test the effect of altering the proportions of the ingredients constituting the ordinary pyro developer. Taking the ordinary standard developer as represented by 2 grains pyro, 1 grain bromide potassium, and 2 minims ammonia to the ounce, he had made a succession of similar exposures on a sensitometer scale, and then developed the exposures in three sets, which were thrown on the screen. In one set the pyro was increased and decreased by regular stages, in the second the bromide, and in the third the ammonia were subjected to the same treatment, the results showing the amount of control of density given by thus varying the proportions.

On the 15th December the subject of "Carbon Printing" will be introduced by the secretary, Mr. W. Bishop; visitors are invited.

LEWES PHOTOGRAPHIC SOCIETY.

*December 1st.*—The PRESIDENT announced the death of Mr. E. Miller, a member of the committee, and the hon. secretary was requested to forward to the relatives a letter of condolence and sympathy. He also mentioned that he had received a letter from the hon. secretary stating that, owing to his professional engagements, he could not devote so much of his time to the Society as he had done in the past, and the committee had asked Mr. Percy Morris to act as a joint hon. secretary, which he hoped he would be able to do.

Mr. PERCY MORRIS read a paper on "The Development and Printing of Hand-Camera Negatives," demonstrating both processes. He used hydroquinone for negatives, and ferrous oxalate for paper.

LOWESTOFT AND DISTRICT PHOTOGRAPHIC SOCIETY.

*December 3rd.*—Mr. STRINGFIELD in the chair.

A series of slides illustrative of "A Journey through the White Mountains of New Hampshire" was projected on the screen by Mr. G. W. STRINGFIELD; a description being given by Mr. W. ROBERTS.

The CHAIRMAN called attention to the instruction classes intended to be held in connection with the Society, and he trusted that ere long these would be combined with other classes, forming a technical school, which should be centred in a suitable and substantial building.

MIDLAND CAMERA CLUB.

*December 4th.*—Dr. HALL EDWARDS (president) in the chair.

A paper was given by Dr. LEECH upon "The Keeping Qualities of Dry Plates," which, however, dipped largely into the question of the invention of the gelatine bromide process, and also with the effect of damp upon plates, and the destruction of the latent image by prolonged soaking in bromide of potassium. Dr. Leech had prepared a complete series of negatives, which were passed round for inspection. Plates were shown made as far back as 1880 (gel. bromide) and 1878 (collodio-bromide). A Swan plate made in 1880, exposed and developed in December, 1891, gave a good result. But undoubtedly the best were of the Liverpool Dry Plate Co., made in 1878, exposed and developed in December, 1891. There was but the slightest trace of marginal fog, and the image was bright and vigorous.

In the discussion that followed considerable stress was laid upon the method of packing plates; the use of paper between was strongly condemned, and it was pointed out that the old methods avoided any such plan.

RICHMOND CAMERA CLUB.

*December 4th.*—Mr. DAVIS in the chair.

The subject of "Lenses" was discussed with the aid of specimens and illustrations lent by Messrs. Taylor, Taylor, and Hobson. Mr. ARDASEER explained the exhibits, which comprised flint and crown glass in the rough state, and ground and polished flanges in all stages of manufacture, and several finished lenses, including one of the casket sets.

Slides were then passed through the lantern illustrating the principle and the action of lenses, and the method of their arrangement in the various combinations commonly in use.

SHEFFIELD AND DISTRICT OPTICAL SOCIETY.

AT the meeting on November 2nd the president, Dr. MANTON, exhibited what he termed a universal lantern, possessing many features of interest, suitable either for blow-through jet, ether, or oxy-hydrogen lime-light, and equally adapted for the projection of transparencies or the demonstration of scientific experiments. The front carrying the objective slides on the extending principle of long-focus cameras, the space between condenser and objective being entirely unenclosed. In practice it was found that there was no appreciable leakage or diffusion of light into the room. Perhaps the greatest novelty lay in the condenser, 3¼ by 3¼ inches square, this being, of course, derived from a slightly larger condenser cut down, and the superfluous arcs of circles removed; the slight loss of light resulting from the increase in focal length being more than compensated for by the power of this small condenser to project on the screen an unmasked transparency absolutely free from colour, and clear to the edges.

The evening was brought to a close by the demonstration of Scott's oxy-etho-benzine lime-light. A member having expressed a wish for a test, the request was granted, although Dr. Manton pointed out that the optical and mechanical advantages were entirely in favour of the oxy-hydrogen apparatus, against which Scott's light was pitted, which was fitted with condensers of the Herschell type and a half-plate portrait lens as objective; the jets, &c., being adjusted to a hair's-breadth, and being fed by O × H from 40ft. cylinders fitted with Beard's regulators. The etho-benzine light, on the other hand, was placed in the experimental lantern above alluded to (square condenser, with its attendant loss of light into the bargain); and an ordinary lantern objective, costing a guinea, of 10-inch focus was employed. The jet recently purchased had not been adjusted and adapted with regard to its bore in accordance with the suggestion of the inventor. The saturator (hot air) had been used for nearly two hours on a previous occasion, and was fed by a partly-used 10ft. bottle of oxygen without regulator. In spite of these disadvantages, the new light stood the trial admirably, and although the saturator had only five minutes' warming, the light was within a few candles of its rival. It was to be regretted that time and other circumstances did not permit of the conditions being reversed—the Scott light being placed in the "swell" lantern, and *vice versâ*; but further experiments will be made and published shortly.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

AT the Masonic Hall, Surrey Street, Tuesday, December 1st., Mr. B. J. TAYLOR in the chair.

Mr. BRAHAM, the representative of the Autotype Company, London, gave a practical demonstration of carbon printing, showing the various processes, from the exposure on the negative to the finished pictures.

The CHAIRMAN announced the winners of the annual competition as follows:— Class 1, Mr. Crowther; Class 2, Mr. Toplis; Class 3, Mr. E. Beck; Class 4, Mr. Bromley first, and Mr. Crowther second; Class 5, Mr. E. Beck both first and second.

The competition slides were then passed through the lantern.

EALING PHOTOGRAPHIC SOCIETY.

THE first *conversazione* in connection with the Ealing Photographic Society has been held at the Municipal Buildings, and the event served to show at once the extent to which the photographic art is practised by amateurs in the district, and also the success of this comparatively young society in uniting them together in a common interest for mutual advantage.

From every point of view the *conversazione* was a gratifying success. About 250 invitations had been issued, and fully that number of guests were present during the evening, locomotion at times proving somewhat difficult in consequence. The exhibits, too, were so numerous that the ingenuity of the committee was taxed to the utmost to find room for them.

The numerous exhibits were illustrative of platinotype printing, silver printing toned with platinum, and all the various processes employed in connection with photography. Dr. Common, one of the vice-presidents of the Society, lent a series of astronomical photographs, and the interest of the exhibition was further enhanced by the permanent autotype photographs lent by the Autotype Company, and the exhibits lent by the Platinotype Company, and by Mr. Geo. Davison and Mr. J. B. Wollaston. Micro-photography was also represented. Photographs of Ealing scenery were scarce, but considerable attention was devoted to one by Mr. Taylor, illustrative of the "village" as it was, and representing the fair formerly held on the green. Messrs. Mawson and Swan had on view a number of their improved apparatus, including the reflex camera, cantilever enlarging apparatus, magnesium flash-lamp, and others.

During the evening a series of lantern exhibitions was given, and music was given on the piano and violin by friends who had volunteered their services for the occasion.

Croydon Microscopical and Natural History Club (Photographic Section).

*December 4th.*—Mr. Edward Lovett (president) in the chair.

Mr. J. Lewis, of Birmingham, demonstrated the kallitype process. In a short and lucid way he described the old method of working the kallitype No. 1, and set forth the disadvantages that it had as regards the manipulation, and otherwise marring the popularity that it might have claimed. He then explained the improved kallitype process No. 2, where all these disadvantages were done away with, and now the process could be worked with a nicety and exactness that called forth no comment. He developed several matt surface and albumen prints.

Friday, December 11th, will be a lantern night for members' slides.

Rotherham Photographic Society.

At the meeting on December 1st in St. George's Hall, the prize lantern slides of *Photography* were shown to an audience of over two hundred members and friends. The description was read by Mr. E. Isle Hubbard (a vice-president), and Mr. James Leadbeater (treasurer) had charge of the lantern arrangements. Slides contributed by Mr. G. T. M. Rackstraw, Mr. W. Mason, and the hon. sec. were also displayed, together with the successful slides in the Society's recent competition.

Leytonstone Camera Club.

*December 2nd.*—Mr. R. Sefton in the chair.

An interesting and amusing lecture was delivered by Mr. Tom Symmons on "The Cad and the Camera." He defined a cad, contrasted caddish and gentlemanly conduct with a camera, and related several anecdotes to illustrate his meaning. He then asked the members present to give their views upon the matter, which most of them did. The question was raised as to whether an amateur had the legal right to snap-shot, print, and distribute copies of an individual against his will. This was left undecided, although strong opinion was expressed as to its reprehensibility considered from an ethical standpoint.

This new Club meets every Wednesday at 8 o'clock, at the Assembly Rooms, High Road, Leytonstone. Visitors are invited.

Dundee and East of Scotland Photographic Association.

*December 3rd.*—Mr. J. D. Cox in the chair.

The slides sent in for competition were passed through the lantern. On the votes of the members present being scrutinised, the following were declared the prize-winners:—1st, D. Ireland; 2nd, J. D. Gibson; and 3rd, G. G. Maclaren.

Two questions were found in the question-box:—"What is the most effective manner of vignetting bromide prints?" The best result was obtained by using a deeply serrated vignetting mask, and kept in motion during exposure.

"A landscape negative, on being fixed, was found to have a clear spot about the size of a threepenny-piece in the centre of some foliage. What is the best way to dodge the blemish in printing? The negative cannot be duplicated." By vignetting in from another negative a suitable piece of foliage, or block out the hole and work in the foliage with a brush on the print.

London and Provincial Photographic Association.—December 17th, monthly lantern night; December 24th, "Warm Tones in Lantern Slides." Visitors invited.

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the Photographic News, Messrs. Piper & Carter, 5, Furnival Street, London.

All other Communications, except advertisements, intended for publication, should be addressed to the Editor of the Photographic News, 5, Furnival Street, London, E.C.

M. P.—We could not answer your question last week for want of the necessary information. A preparation of paramidophenol is now brought forward, as we stated a fortnight ago, under the name of rodinal, and the sole agents for it in this country are Messrs. R. W. Greeff and Co., of 29, Mincing Lane, E.C. They would be able to give you all particulars.

Swen.—Obviously, any room of sufficient size can be used under the conditions stated. Electric light is far more certain than magnesium, and you should endeavour to visit a studio such as Van der Weyde's or Mayall's, where it is in constant use. The arc light is necessary for the work, the incandescent being unsuitable. You would have sufficient power for an arc, and you could not do better than follow the precedents already indicated for its arrangement.

Verax.—Soft limes are generally advocated for use with the blow-through jet, and hard ones for the mixed jet. The latter can be used for the blow-through, but it is not expedient to use the former for a mixed jet, for the gas pressure will often split the lime into several pieces. A good substitute for lime is, as you suggest, a desideratum, and rumour says that several persons are hopeful to find such a substance.

M. O.—1. If the contrivance is patented, you have no right to make it, although it may be only for your own use. 2. An inventor, as a rule, gets little enough as a reward for his industry and ingenuity. The prizes are very few, and the blanks many. We once heard that careful calculation showed that only one per cent. of the things invented brought any profit at all to their originators.

James.—Publication of your letter would give offence to many, and would bring no possible credit to the writer. If you are aggrieved, go to a solicitor and take his advice.

Moke.—The views are contradictory, certainly, but the explanation of the conflicting statements is not far to seek. A. is evidently an experienced and careful operator, who, for many years, has been accustomed to deal with explosive compounds, knows their properties, and will take every precaution to prevent accident. With him the apparatus is safe. B. is quite another man. He would step in where angels fear to tread. His ignorance makes him unconscious of danger, and his invincible conceit makes him certain that he can do everything better than anybody else. With him the same apparatus is a terrible engine for mischief, and about as dangerous a thing as can be handled.

T. S.—Apply to Messrs. Chance, Birmingham.

At a general meeting of the Camera Club held on the 26th ult. certain resolutions, of which notice had been given by circular, were duly passed. The effect of these is that all town members—now paying three guineas—will pay four guineas on and after the 1st of January next, and all country (not being *foreign*) members—now paying one guinea—will pay two guineas, except those country members who have a residence, place of business, or regular occupation within the metropolitan postal district, who will henceforth all rank as town members and pay four guineas.

The "Dore" Lantern Slide Printing Frame.—This frame, with respect to which we simply noted in our last the application for a patent, has the following among other advantages:—(1) It has no loose parts whatever, thereby preventing delay and mistakes in the dark room; (2) negatives of any thickness are held in position securely and automatically without the aid of screws or wedges; (3) any part of a negative can be printed from in any position and at any angle; (4) any number of transparencies can be printed from exactly the same part of negative without any readjustment; (5) light is kept from the edges of transparency plates, and from all other parts except through the negative; (6) no risk of breaking a negative from securing it too tightly in position.

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

VOL. XXXV. No. 1737.—*December* 18, 1891.

CONTENTS.



## PICTURES FOR THE PRESS.

THAT this is an age of abundant book and newspaper illustration every one must admit, for it is difficult to take up a publication of any kind without coming across at least one or two pictures. These are commonly called "cuts," but the word is a misnomer, for in the great majority of cases the blocks from which the illustrations are printed have not known the cut of the graving tool. Most of our readers, being photographers, know how such illustrations are produced. The original is a line drawing executed with a pen in very black ink on white card; this is photographed and reduced in the process, and the image is transferred to a zinc plate which has been made sensitive to light, which plate is afterwards etched in the acid bath so as to leave the lines of the drawing standing up in relief, and amenable to the printing press.

Wood-engravers, naturally, do not like this process work, for, to a great extent, they find their occupation gone. Artists, too, whose chief business it was to draw on the wood, or to make drawings on card to be afterwards photographed on the wood for the engraver, are wont to speak disdainfully of it, for they find that the times have changed, and they must work on new principles altogether. It was their comfortable custom to leave much of the artistic effect in their drawings to the skill of the engraver. In the hands of a skilful one, a vague wash of colour became a network of lines, giving all the effect which the artist wanted to convey with very little trouble to himself. And so it came about that, among a large class of artists and art critics, the new method of work has been condemned as "inferior and rubbishing process work," which degraded modern illustration. Those who still hold such views would do well to suspend their judgment, or, at any rate, to abstain from giving public expression to it, until they have had an opportunity of seeing what process work is capable of in the hands of an artist who really understands it.

Mr. Henry Blackburn, the author of those charming illustrated catalogues entitled "Academy Notes," which have now appeared for so many years, has made a study of this subject, and probably knows more about it than anyone else in the world. Authors of books and editors of illustrated papers owe him a debt of gratitude, not only for what he has done, but for what he is doing, in educating a large number of artists; for he has established at No. 123, Victoria Street, Westminster, a school for tho instruction of students in this new method of illustration. He does not undertake to teach the elements of drawing; he leaves that to the various schools of art which are now, happily, so common throughout the country. What he does is to enable pupils from such schools to turn their knowledge to practical account. In effect, he says to them: "You cannot expect to make a living all at once by sketching and painting, but I can show you how to produce drawings for which there is an increasing demand. Study under me for a couple of months, and I will initiate you into this phase of art, and you will soon be able to turn out good work."

A recent visit to this busy studio opened our eyes to the wonderful things which are possible to the artist in pen-and-ink. As a rule, a man, in taking up this new art, has as much to unlearn as he has to learn, one of the prime difficulties being that of acquiring a sufficiently bold touch. Beginners in pen-and-ink work are apt to adopt a niggling style of drawing, their object being to make the work appear as fine as possible. They look at an ordinary wood engraving, and see there that the lines are somo of them not broader than a hair, and that, as a rule, they are very close together, and they attempt at once to reproduce the same effect. Most of them act thus from ignorance, being unaware that process blocks are made from drawings many times larger than the picture which ultimately finds its way into the printed page. If one of our readers would wish to see for himself how far this reduction is carried, let him make a photographic transparency or lantern slide of one of the three-inch drawings in "Academy Notes," and enlarge it by means of the lantern to eighteen inches or two feet; he will then, to all intents and purposes, have the original before him from which that block was made, and he will at once acknowledge that much art is necessary in putting together those lines. By such an analysis or dissection of the picture we can learn that lines which look coarse and almost meaningless when examined at close quarters, assume an artistic effect when viewed at the proper distance; and it is obvious that the same effect is brought about by reducing that drawing and examining it from a nearer point of view. By enlarging the picture we have carried out the operation of analysis; but the students at Mr. Blackburn's studios work by just the opposite method—that is to say, by synthesis. Every line that they draw must be a bold one, and must have a certain meaning, and the student must have continually before his mind the idea that the subject which he is working out is to be greatly reduced when it appears as a finished block.

Mr. Blackburn's students have one very great advantage in access to a vast library of what we may call reference works. The annual publication of "Academy Notes," and other books of the same kind, has led to the collection of a vast number of drawings by our first artists. These are all excellent in design, but some of them are not suited to reproduction; thus the student has before him examples of what should be followed, and what should be avoided, and this, we consider, is one of the great advantages that he possesses in going to Mr. Blackburn for instruction.

It is common to hear men who are looked upon as authorities upon art, and more especially upon the work of illustrating books and newspapers, express the opinion that zinco work—as it is commonly called—cannot for a moment be compared to wood engraving. If they were to see some of the beautiful work turned out in this studio they would be forced to alter their opinion. Indeed, in many cases, with all their experience, they would be apt to assert that the finished results placed before them were in reality the work of the engraver, so closely do some of these drawings in pen-and-ink resemble the best work of the older method. It has long been the reproach of English illustrations that they do not come up to the standard which is common in France and America. We may hope that, in a few years, when Mr. Blackburn has launched a few more capable artists on their career, this reproach will no longer obtain.

Silver Fluoride.—A solution of well-washed silver carbonate in hydrofluoric acid is evaporated to dryness, with constant stirring, in a platinum basin, and the resulting black pulverulent mass is dissolved in water and filtered. The clear filtrate, which, when left in contact with silver foil, yields crystalline silver subfluoride is evaporated in the dark in a vacuum over sulphuric acid. As thus obtained, silver fluoride forms a yellow, transparent, tough, elastic mass, which is soluble in water, and melts at a dull red heat (the temperature, as determined by Le Chatelier's thermo-electric method, is 435°). Silver fluoride reacts violently with the chlorides of phosphorus, silicon, and boron, and with phosphorous oxychloride, yielding the corresponding fluorine compounds of the non-metal and silver chloride.—*Journal of the Chemical Society.*

## NEW ZINCOGRAPHIC PROCESS.

The *Bulletin de la Société Francaise* describes a new and simple application of the zincographic process, of which the following is a summary. It requires a very short exposure to light, and presents other advantages, which may be gathered from our description. A plate of perfectly polished zinc is treated in an acid bath composed of water 100 parts, nitric acid 3 parts, for about two minutes. It it now washed, and the still wet plate is coated with water 100 parts, gum-arabic 10 parts, bichromate of potash 4 parts; while the plate is spun in the usual manner to get an even coating by centrifugal action. If necessary, the drying can be accelerated by moderate heat. Thus prepared, the plate is exposed to light under a phototype positive. As the preparation is very sensitive, an exposure of from three to ten minutes in diffused light will be found sufficient. When the exposure has been judged to be sufficient, the zinc plate is removed from the printing frame, and an etching solution consisting of iron perchloride and copper chloride is poured over it in one even wave. This liquid penetrates all those parts of the plate which have not been rendered insoluble by exposure to the light; that is to say, those parts of the zinc which correspond with the positive which in the original were represented by black lines and shadows. It attacks, then, the zinc, which blackens in those parts. As soon as the image appears to be complete—a work of very few seconds—the action must be immediately arrested by rapid washing under a strong jet of water, followed by a sufficient rubbing of the metal to remove the still adherent gum coating. The plate is now inked in the usual manner, and kept clean and moist by the occasional use of a wet sponge.

The process is really one of extreme simplicity, the different manipulations occupying a very short time, and it does not require any special aptitude or manipulative skill. It may be mentioned that the addition of the copper salt to the etching solution has the effect of depositing that metal in a pulverulent form on the zinc plate, a condition of things which enables the lines to retain the ink with great facility.

## VIEW-FINDERS.

The following remarks on this subject are contributed by Mr. George Ewing to the *Journal of the Photographic Society of India*:—

In connection with the weakness of the centre of a picture, I have said that I view with disfavour the growing use of view-finders. The remark requires explanation. If a view-finder is employed for the purpose of ascertaining when a moving object is in the centre of the field, then I consider that its use cannot be too strongly reprehended; but if some simple appliance will readily inform us of the amount of view that will be included by a certain lens at a certain spot, I should assuredly recommend its enlistment into our service. Fortunately, we have such apparatus at our command, though they (with tables of conjugate foci which serve the same purpose) are not as much used by amateurs as they should be. Probably their simplicity is against them, for it is a characteristic of the young amateur that he will have nothing to do with things that are common and therefore unclean. The trait is, I believe, another manifestation of original sin.

The view-meter I recommend is a leather-covered strip of cardboard having an upright piece with a minute eyehole at one end, and a sliding frame with an oblong opening at the other. To use it, first erect your camera and focus any view that may be most convenient; then, standing as close as possible to the lens, slide the oblong frame up and down the strip of cardboard till, looking through the eye-piece, the opening includes exactly the same amount of view as the focussing screen; mark on the cardboard base the position of the sliding frame. If you have more than one lens, proceed in the same way with each, focussing some view, and marking on the cardboard the position of the frame in each case. The value of the contrivance must now be obvious. When, out in the field, it is necessary to know whether, at a certain spot, any of the lenses available will take in a certain amount of landscape, instead of setting up the camera, it will only be necessary to draw out the view-meter and, by sliding out the frame till it includes the desired view, observe on the base whether any lens will include the same angle of view. The usefulness of such a view-meter for quick selection of subjects cannot be over-rated.

The most popular type of view-finder is of the camera-obscura pattern. It is a little cardboard box with a tin hood on one side and a cheap lens on another. The interior is divided diagonally by a mirror which reflects the image thrown on it by the lens on to the ground glass covered by the hood. It is attached by a stud to the side or top of camera. Though this is the most popular form of view-finder, and is besides the only one used in hand-cameras, I consider it about the most useless. The lenses are almost always the worst obtainable; they seldom cover the glass, and, as the foci of the lenses in the finder and in the camera are not relatively proportionate, the view on the finder is quite different from that found by the camera lens. Their only use is to centre a moving object on the sensitive plate; but as this is far from desirable, and as the end may be equally well obtained by simpler means, as I shall show further on, I should recommend my readers to leave them alone.

A third and equally objectionable form of finder is that, recently introduced, in which an ordinary spectacle lens ("minifier," as it is sometimes called) is enclosed in a circular brass frame with an oblong opening. It is generally fitted to the top of a camera, but, as the view included by it varies with every movement of the spectator, its practical value is simply *nil*.

The only useful finder that I know of is formed of an auxiliary lens, of the same focus as that used in photographing the view, set in a movable arm. In use, the focussing screen is raised upright, and kept perpendicular by struts and bands. The auxiliary lens fixed on top of the camera front throws on the ground glass the scene before it; and, as the focus is coincident with that of the lens below, the image on the screen and on the sensitive plate will be identical. When the image on the ground glass is sharp, that on the plate will be equally in focus; when the camera is racked in or out, the blurring in both plate and screen will be exactly the same. The advantage of this arrangement in "instantaneous" work is very great. Supposing we want to photograph a moving object; we first fix the best spot to take it and focus the point sharply, then lift up the glass upright, attach it to the struts, set the shutter, fix the dark slide in position with plate exposed, and await developments, one hand on the focussing screw, the other holding the pneumatic ball. If the object pass the spot fixed, of course there will be no trouble; but suppose it appears a little in advance of or behind the fixed point, a slight turn of the screw will bring the subject in focus on the screen on top, and a squeeze of the pneumatic ball will fix it sharp on the sensitive plate below.

## GAS BOTTLES AND THEIR SAFETY.*

BY F. A. BRIDGE.

The use of gas in cylinders has now become so common that the public has ceased to regard it as fraught with any risk; and, considering the immense number of cylinders now filled and emptied every week, the few accidents that have happened certainly justify the confidence hitherto reposed in their safety.

The explosions which have occurred of the cylinders themselves have been very few indeed; and I think I am right in saying that although, unfortunately, fatal consequences have always ensued, fortunately, the cause of the explosion or bursting has been satisfactorily accounted for, and has in every case been due to putting oxygen into a cylinder already containing hydrogen, or *vice versâ*.

As far as I am aware, no case has occurred of the bursting of a cylinder from over-pressure; I mean, of course, in ordinary use, as they are usually tested to double the strength they are supposed to have to withstand. Stories are told of fifteen, and even seventeen, feet of gas having been pressed into a ten-foot bottle; but it has never occurred to me—at least, if it has, the extra has never been charged for; so I am inclined to think it was not there. Accidentally or intentionally, very severe tests have been applied to cylinders by gas compressors, tending to show that the ordinary knocking about they receive is not likely to cause much damage to them. Full cylinders have been known to fall from an upper window on to the stones below without exploding; heavy weights have been dropped upon them from a great height without doing any further harm than spoiling their outward beauty, which, it must be confessed, is not very great. We may, therefore, say that, so far as the cylinders themselves are concerned, there is not much to fear, as, except accidentally, the ordinary user would never expose them to such tests as they are subjected to by those who make or fill them. We may here say that, during their transit from place to place, cylinders receive a great deal of unnecessary ill-usage. Sometimes the gun-metal nozzles and valve pins become damaged in consequence, and stories have been told where they have become so loosened that the effort made to screw up the valve after use has caused the entire nozzle to give way. In one instance it is said that the nozzle of a cylinder in use out of doors for signalling purposes went up so high that it was *several minutes* before it came down again. Whether the man in the moon (had he so desired) could have put out his hand and caught that nozzle was not stated. Only recently, at one of the principal railway stations, a large cylinder was let down suddenly on the nozzle; the result was a waste of eighty feet of oxygen, and a general scare among the passengers on the platform. These accidents, however, might have been easily prevented by putting the cylinders in boxes during transit.

What we really have to consider to-night is the bursting of gas regulators and gauges; and our object is to find out, if possible, the cause of these accidents, and so, by taking

* A paper read before the London and Provincial Photographic Association.

due precautions, endeavour to make them as rare as possible.

First, then, the regulators. There are not many worthy of the name, the best, to my mind, being those made by our friend Mr. Beard. The principal fault with other makes I have seen tried is, either that they *don't regulate*, or, if they do, their action is so erratic as to make them unreliable. As to gauges, the simplest form is known as "Suiter's Patent." Here you have no glass, and the worst that can happen is the blowing out of the end of the tube, and waste of the gas. The well-known Bourdon gauge is much used, and very useful, because it can be kept attached to the cylinder, and it is easy, by its means, to see from time to time how the gas is going. I need scarcely say it is not safe to use one of these for oxygen which has been used for any other gas; very serious accidents have occurred through this having been done.

Not many days since (as you are, of course, aware) an exhaustive enquiry was held to ascertain the cause of the bursting of both a gauge and a regulator, and this is really the reason the subject of "Gas Bottles and their Safety" was chosen for our consideration to-night.

On Monday last I received from an old friend a letter commencing thus:—"Dear Bridge,—Did we not waste an evening on Wednesday discussing the cause of the accident, and then only come to an erroneous conclusion? Had we waited another day, we should have seen the note in *Photography* giving us the true cause." Now, I need scarcely say that this was what the late Artemus Ward calls "rote sarkastik." The paragraph alluded to is as follows:—"The inquiry into a recent fatal explosion of a gas-bag has barely concluded, when an explosion which might have been serious has taken place in connection with the use of cylinders. The explosion, however, was more due to the way the cylinder was handled than to any inherent-in-itself tendency to create disaster. At the meeting of one of the London clubs last week, a new cylinder was about to be tested with a view to ascertaining its contents. The pressure gauge was screwed on, and then the tap was turned fully on too suddenly, the result being that the gauge was blown out and fixed itself in the ceiling, considerably startling those who were present. Had it come in contact with the persons of either of the operators, it would, doubtless, have been a serious matter to them. This accident need not, however, alarm cylinder users, but simply impress upon them the necessity of taking the precaution to allow the gas to enter the pressure gauge slowly, when no fear of such an untoward occurrence need be entertained."

If this paragraph is intended to refer to the explosion of a gauge and regulator in my hands at a recent photographic meeting, the communications of the gentleman to whom the editor is indebted for this unofficial information should in future be taken with a much larger quantity of salt than appears to have been used on the present occasion. I say *un*official, because the meeting at which the accident happened was a private one, and any official communication must have passed through my hands. My opinion is, however, that my friend's sarcasm has been thrown away, and that the paragraph does not refer to us at all, but to some similar accident which has occurred elsewhere, and of which we shall, perhaps, hear more anon; because, in my case, the cylinder was not a new one, the tap was not turned fully on too suddenly, no portion of the gauge fixed itself in the ceiling, there was only one operator, and the accident could not have been due to the way the cylinder was handled, because the advice so kindly given in the concluding sentence was most carefully observed. I may here, perhaps, be allowed to remark that several absurd and exaggerated accounts of this accident are floating about. One gentleman has stated that he was blown *several feet* by the explosion. Now, I must confess that those in the immediate vicinity of the little dark room in which the accident happened did retire with great alacrity, and may have been even humming the old refrain, "We left him alone in his glory," for aught I know, but the sudden withdrawal was not due to gas, but *fright*. The upward pressure, as I shall show you, was for the moment very great, but the lateral expansion was not sufficient to disturb either the scores of little things on the shelves of that small dark room, or the folders that rested so gracefully on my nose. No doubt they speedily found themselves several feet away, but the instinct of self-preservation is strong, and possibly Mrs. Partington's son Ike was quite right when he said, "In railway accidents and suchlike, absence of body is better than presence of mind."

I am getting rather tired of repeating the story of the explosion. It seems to me as if every other photographer I have met during the last fortnight has asked for details, and I have been bound to tell him the truth, and the whole truth. However, as I have to open the discussion this evening, and the subject has been selected in consequence of the accident, I will tell you as briefly as possible exactly how it happened.

Wishing to know whether a cylinder was full or empty, I removed the guage and regulator from the one just exhausted, and firmly screwed it into the cylinder the contents of which I was anxious to ascertain. Turning the gas slowly on, the guage immediately responded. I then turned the gas off again, and, calling a friend (Mr. H. M. Hastings), I repeated the operation of turning on the gas. The needle of the gauge rapidly registered 120, went past that number, and, before I could turn the gas off again, the explosion occurred. I still held on to the cylinder, and endeavoured to stop the waste of gas. The valve, however, would not act, and, after inhaling more oxygen than was good for me in one dose, I came out of the dark room (the way was quite clear). After a few breaths of air as fresh as I could obtain in a room full of tobacco-smoke, I went back and had another try; but it was of no use. When all the oxygen had escaped, I went into the dark room again, lit the gas, which had been extinguished by the explosion, and looked around. The gauge had snapped short off at the stem, and was lying on the floor. The dial was missing, and the glass, of course, blown to atoms. The top of the regulator was imbedded in the ceiling, and the cover of the regulator-case was missing.

On examining the connections, it was found that the cone fitting the interior of the bull-nosed nozzle of the cylinder was partially melted, so was the neck of the cylinder itself; the end of the valve pin was also melted away. The oxygen had evidently fired in the neck of the cylinder. The end of the Bourdon tube in the gauge, unable to sustain the immense pressure, had burst, bulging the side of the case, forcing out the dial, and, as I said before, smashing the cover-glass to atoms. The fire had travelled partly along the tube leading to the gauge, but had not entered the gauge itself. It had travelled mainly in an upward direction, forcing itself up one side of the regulator, impinged upon the side of the case, burst the india-rubber bellows, blown away the top, partly melted the solder at the top of the cover, and scorched the lacquer outside.

We now come to ask the cause of all this, and the answer undoubtedly is: oil in the neck of the cylinder. Chemists tell us that oxygen at high pressure, brought into contact with oil, more especially oil which has become gelatinous or glutinous, will immediately fire. In the early part of the present year an article appeared in the *Nineteenth Century* bearing upon this very subject in connection with gas bottles, and describing almost exactly what occurred in the present instance. How came the oil there? That is the question. We have been informed that at one time these kinds of pressure gauges were tested with oil, and this may have been one from which it had only imperfectly been removed; but the gauge had been in use quite two years, and, as I said before, there was no trace of fire in the gauge itself. Oxygen compressors tell us they never use oil to lubricate the valves of cylinders, but the portion of the valve pin, when withdrawn from this cylinder, was covered with black oil, and the same thing was found in the aperture from which it had been taken. Curiously enough, too, I have taken the pins out of two other cylinders, and these are both greasy.

Gentlemen, I will not trespass further upon your patience. I only hope the discussion which follows will tend to clear up the question. The conclusion arrived at a week ago, when this matter was under consideration, was: Oil in the valve, but how it came there there is no evidence to show. Several men of great ability and experience have been consulted on the subject, including Messrs. Adolphe M. Levy, Newton, Newton, jun., T. Ottway, T. E. Freshwater, R. R. Beard, G. R. Baker, Murray (Brin's Oxygen Company), and T. North. As you know, I have had a good deal to do with oxygen in bags, gas-holders, and bottles, and have been using the lime-light almost daily for many years. The concensus of opinion is, as I have said before, oil in the valve.

Gentlemen, what happened to me may at any time happen to you. Let us, therefore, endeavour to find out where this oil comes from, and we shall have done something towards preventing accidents. In conclusion, I should like, if you will allow me, to give you a few words of caution. When turning on or off gas in cylinders, always hold them at arm's length; I invariably take this precaution. The top of the regulator in this instance passed within two or three inches of my head, and imbedded itself in the ceiling. Had it not been for the precaution I have alluded to, it might have found a softer spot, and in that case I should not have had the pleasure of opening the discussion this evening.

## THE MAKING AND WORKING-UP OF TRANSPARENCIES.*

BY GEORGE E. THOMPSON.

I have a nondescript room at home. A 6½-feet billiard table stands in the centre, its wooden cover making an excellent work-table, steady, firm, and of an admirable height to stand to. This top is divided into three, and either the chemicals, or the soap-suds of spring cleaning (always carried on if I go away on a tour), have gone down the divisions and discoloured the cloth. But this is beside the mark. The table is always loaded with boxes, parcels, transparencies, negatives, and everything that can be wanted, besides much that is superfluous. The centre gas is capital to retouch by. Around the room are book-cases, pictures, corner cupboards, old oak, a carpenter's bench, a lathe, &c., and in one corner is a tank for water. A wooden frame covered with brown and another with white paper, and having a 2-feet orange window in its lower part, can be adjusted to the window, and then the room is a dark chamber. The white screen also answers for lantern shows.

But what has all this to do with lantern slides? I make them there, and like to begin at the beginning. Finally, then, take an unvarnished negative and place it on the retouching desk. Spots must be filled in as cleanly and neatly as possible. There are two implements, the brush and the pencil. Take a fine, small brush and (say) lamp-black. Use very little paint, and as nearly dry as possible, and very delicately work it in. If watery and heavy, you are sure to make the spots blacker and larger than need be. The pencil—a good B with a fine point—is most useful for the filling up of semi-transparent marks, and in putting high-lights on the water, or in the sky. A transparent spot may suggest the black hull of a distant boat. Draw the sail, also the reflection, delicately in with the pencil; or a bird may be drawn in, and the picture lives. The sky may be dirty. If so, matt varnish the back of the negative, and when dry work on it with a stump and black-lead; or, if a thin negative, cover with tracing paper and work on with colour or lead, always remembering that, when putting in a sky, you must treat the cloud forms as negative, not positive.

Now for the transparencies. These are best made in the camera by reduction, the manipulation of which I presume all here know. Some negatives will do for contact printing. If a soft, over-timed negative, you can get an excellent result on a chloride plate, thereby obtaining rich brown, red, or even green tones. Hard, under-exposed negatives give, in my experience, black, hard slides when made on chloride plates, while I have found the reverse to be the case with Alpha plates. Mawson plates give rich, dark brown slides when developed with pyro and metabisulphite, but the development should not be carried too far, as they dry darker. Hydroquinone and black tones are the easiest to manage.

And now, having made your transparency, you want to show it at its best. And here a great number betray their ignorance of the commonest rules of art. How is it that some exquisite subjects, perfect in photography and in manipulation, disappoint when thrown on the screen? I remember one lime-light show when I wished that I could get at the slides and rip them all, or nearly all, open with an oyster-knife. And why? They were lovely subjects, but badly (nay shockingly) masked. Here, a river with tender distance and fleecy clouds, but with a great waste of uninteresting water in the foreground. In such a case the part above the horizon should have occupied nearly two-thirds, and the water one-third; a bird or two might have been introduced, and the picture would have been perfect. Many of the set of which I speak had the horizon line in the centre, a most uncomfortable state of things. We cannot say more here about composition, but we should all make it a study. Study pictures and find out why they are charming. Don't scruple to cut away parts which are not required. Don't fit your picture to your mask, but your mask to your picture. Double up a sheet of black paper into widths of 3¼ inches and chop away all down the length, making the strips any width you

* Abstract of a paper read before the members of the Liverpool Amateur Photographic Association.

please, and then mask all up with square corners, with narrow or wide pieces to suit your pictures. Another great blemish noticeable iu many trausparencies is the very bad spotting, or even its total absence—stars not only shiniug in the sky, but through houses and walls.

I use a fine brush and a B pencil, and I will now expose one of my pet dodges or fakements. You want to throw up part of a picture; take this vine, for instance. The one plant must stand out from the field; therefore, blacken the surroundings. And now comes the rub; the pencil won't bite! But breathe gently on the film, and mark the effect. You can build it up to almost auy extent; but the work must be done patiently and gently, or holes will come. Perhaps your trees are waviug. Then you must carefully titivate them up with a few touches of the pencil. The small boat which was worked in ou the negative will require a touch, as also the birds. It is a labour of love and good practice, and a few touches of this kind done in an artistic manner will, with proper masking, make all the difference betweeu an uninteresting and a fascinating slide.

## FRENCH CORRESPONDENCE.

BY LEON VIDAL.

Photographic Society of France—The Peligot Medal—Photo-Micrographic Apparatus—Aristotype Emulsion Paper—A New Process of Photo-Zincography—Lantern Slides for the Detection of Fraud—Photo-Ceramic Paper—Aluminium Fittings—National Conservatoire of Arts and Manufactures—Photographic Club.

The last meeting of the Photographic Society of France was replete with interest, and we will take a brief survey of the principal matters brought forward. The son of Monsieur Peligot—formerly president of the Society—has, in memory of his father, given a sum of money to be expended in the purchase of medals, which medals are to be distributed by the Society to those considered worthy of the honour. The first of these medals is now about to be awarded, and a committee has been instructed to nominate a recipient. Their work is not altogether easy, for they will have to make a selection from a large number of persons whose merits may be equal. It is proposed to award this medal at the meeting of January, 1892.

Messrs. Bézu, Hausser, and Co. brought forward a photo-micrographic apparatus which they have just constructed with a view to all the exigencies of this kind of instrument and its applications. It is a beautiful piece of work, and can be used either as a microscope or for purposes of projection, according to the nature and dimensions of the object to be reproduced. The camera is placed vertically, so that the object remains horizontal—an indispensable condition in the case of liquid preparations.

Messrs. Véra and Martin showed the results obtained on a new paper prepared with an emulsion of chloro-citrate of silver. Papers of this type are coming more and more into request, and are gradually tending to supersede albumenised paper. Time will show how far this replacement will advance. If the albumen process has its defects, its rival, at any rate, is not free from vices, and it will be seen in time which will give the best and most durable results.

Messrs. Lumière fils have modified the zincographic process previously published by them. Their new process bears, as an essential feature, the employment of cupric chloride introduced into the etching fluid. The method is fully described in this week's Photographic News. The chief advantage in this addition seems to be that the ink takes with extraordinary readiuess to the parts upon which the copper is deposited. Examples of this method of working were placed before the meeting.

Monsieur Londe demonstrated the use of photography in the detection of various kinds of fraud and sophistication, and expressed the hope that the day would come when an apparatus for projecting photographs on the screen would be found iu every court of justice, so that a jury could quickly see for themselves the difference between the false and the true. Such an apparatus would also serve to throw the enlarged image of a plan or map to which attention had to be directed, an obvious improvement upon the custom which exists now of passing a small chart from hand to haud.

Mous. Guerot has indicated a method of preparing a gelatine paper, charged with vitrifiable powder, to be subsequeutly sensitised with bichromate of potash, forming a transfer for ceramic work. The process requires experiment to determine several points which at present are obscure, and the matter will receive further attention at our hands when the results of these experiments have been reported upon.

Aluminium tends to become very useful to photographers. Monsieur Richard has been using it for camera fittings, and by its aid ensures a lightness of apparatus, which, in the case of large cameras, is a most importaut modification.

The conferences of the National Conservatoire of Arts and Manufactures were duly inaugurated in September last by Monsieur Laussedal (director of the Conservatoire) and Monsieur Davanne, wheu the theme of greatest interest was the application of photography to history. A very numerous audience testified by applause the great interest taken in the subject. Monsieur Demeny, by means of photo-chronographic apparatus, demonstrated how photography could be applied to the study of animal movement. All this was found most interesting, and reflected credit on the organisers of the meeting. Monsieur Lippmann is to speak on the subject of photographs in colour on a future occasion. The Photographic Club of Paris in its turn invited its friends to hear a lecture on the same subject from the lips of Monsieur Baudrou, who maintained the possibility of photography in colour; but, as he gave uo proofs of his power to accomplish this work, we must suspend our judgment until we know more of his capabilities iu this respect.

Nature of Colloidal Solutions.—A study of the properties of colloidal solutions leads to the conclusion that such solutions consist of very finely divided matter which is held in suspension in the solvent. In order to obtain evidence as to the correctness of the above view, the authors have examined the behaviour of colloidal silver solutions. Silver being an excellent conductor of electricity, a measurement of the resistance of such solutions should aid in determining whether the silver particles are held mechanically in suspension in the solution, or are present as molecules in the dissolved state. In the first case the liquid would be a non-conductor, in the second metallic conductivity might be expected. The experiments show that colloidal silver, either in the solution or in the solid condition, is a non-conductor. These results, taken in conjunction with the other properties of colloidal solutions, confirm, therefore, the views expressed above as to the nature of such solutions.—*Journal of the Chemical Society.*

## PHOTOGRAPHY OF THE HEAVENS.

BY CAMILLE FLAMMARION.

The International Photographic Congress, organised several years ago by a group of astronomers for the purpose of applying photography to the study of the stars, met recently for the third time at the Paris Observatory, and agreed upon the latest arrangements for photographing the heavens.

The idea of applying photography to the curious things in the sky came to light on the very day when the great discovery of Niepce and Daguerre was publicly announced in the memorable account which Arago gave of it at the session of the Academy of Science, April 19th, 1839. The illustrious astronomer, perceiving at once the many and diverse uses to which the discovery could be put in astronomical research, pointed out, among other things, the possibility of obtaining a good map of the moon, and a perfect representation of the solar spectrum. But the methods of photography at that day were too crude to admit of securing satisfactory results. However, about the year 1845, Sizeau and Flaucault contrived to take an excellent photograph of the sun in 1·6 seconds, a very fine engraving of which may be found in Arago's complete works. In 1849, William C. Bond, an American astronomer, obtained a good Daguerreian proof of the moon. The eclipse of the sun on July 28th, 1851, was photographed by Berkawski, at Königsburg, upon a Daguerreian plate, which disclosed for the first time traces of the corona that envelops the star of day, and the eruptions that emanate from its surface.

In 1857, Bond obtained a very clear photograph of the double star Miza and Zeta in the Great Bear, as exact in truth as the micrometric measures, for I have been able to insert it as document in my catalogue of double stars. It was at the Harvard College Observatory that these five photographs of stars were made, and it is there to-day that Professor Pickering obtains such marvellous results that in themselves they appear at least to equal all those of the twenty to thirty astronomers composing the European Congress.

Mr. Warren de la Rue, in England, and Mr. Rutherford, in the United States of America, obtained magnificent photographs of the moon between 1857 and 1867, that have not yet been surpassed. Let us note among these photographs some startling stereoscopic views that show the lunar globe so much in relief that it has almost the form of an egg. This effect, somewhat exaggerated, is due to the advantage taken of a certain movement of libration, in order to penetrate more or less satisfactorily the invisible hemisphere of the moon. Warren de la Rue, to whom we are indebted for these stereoscopic photographs of our satellite, succeeded equally in obtaining views of the planet Jupiter with an exposure of twenty-six minutes.

M. Flaye, in France, has been one of the most ardent advocates of astronomical photography. Insensibly, despite the opposition of astronomers who were first of all mathematicians, photography made a place for itself among the processes of the study. It was applied with the greatest success in observing the transit of Venus in 1874, and again in 1882. In 1877, M. Janssen, at the Observatory of Meudon, obtained admirable photographs of the solar surface, upon which the observer seems to assist, so to speak, in the phenomena of the formation of light. These photographs of the sun are almost instantaneous, for they are taken in a half one-thousandth of a second. In 1844, MM. Paul and Prosper Henry, while making maps of the stars for the atlas of the Paris Observatory, set themselves to substituting photography for direct observation, which at the time was much more expeditious and certain. At the same time, and afterward, Messrs. Pickering, in the United States; Gould, in the Argentine Republic; Gill, at the Cape of Good Hope; Common and Roberts, in England, devoted themselves with the best success to the practice of celestial photography. Thus gradually, insensibly, photography came to take a large part in astronomical research. This part from day to day becomes more and more important, more and more fruitful.

It is now proposed actually to photograph the entire heavens, and it was with this end in view that astronomers organised the International Congress, which met first in 1887, then in 1889, and again last April. In its recent session the Congress paid attention very largely to technical details. A score of questions were discussed, involving all-important points in the preparation of plates, the processes of taking and developing, of reproducing pictures from the stereotypes, &c., and the methods of undertaking the great photographic work—the division of the zones, and the distribution of definite sections of the heavens to various observatories and observers for their respective fields of labour.

Mague, Director of the Paris Observatory, made a statement relative to the progress made with the instrument which he invented for photographing the heavens, and he suggested the time at which he could begin experiments. Owing to political events in Chili, and troubles in which some other States are involved, it will not be possible for all to begin work at the same time. Among other things, the Congress was concerned with the choice of guide-stars; that is to say, those which must constantly be held at the same point of view in order that every star may be represented upon the map by a point and not by a measurable space. But what limit should be placed upon the distance of the guide-star from the centre of the plate? After much groping about, the Congress decided to leave to each observer a certain latitude, not to exceed forty minutes. Questions of this nature, though secondary, were novel and delicate, and the divergencies of opinion brought out by them were inevitable. Many difficulties were suggested that can be solved only by long experience; difficulties that will vary with the physical and atmospheric conditions of the various observatories. A certain liberty of action was, therefore, left to each observer, the Congress simply determining the end to be attained.

The Congress adjourned, after having made the best arrangements that the present state of astronomic photography allows for a work of gigantic proportions and immense difficulty. The matter in hand involves the photographing of the entire heavens, and the construction from the results of a complete map, which will show the starry firmament just as it appears to the inhabitants of the earth; and this by photography alone, by which errors of observation will be wholly eliminated. We already have a map of this kind, but it is relatively imperfect and heterogeneous. For example, Argelander, in 1862, made a map of the northern hemisphere, showing all the stars up to the ninth magnitude inclusive; and this map registers 324,198 stars, all of which can be seen on the same sheet. This great atlas of Argelander is one of the most important and considerable works of this century.

(*To be continued.*)

## Notes.

With the beginning of the new year, the Photographic News will be published by Messrs. Alexander and Shepheard, 21 and 23, Furnival Street, E.C. Business matters connected with the paper till the end of the present year will be transacted by Messrs. Piper & Carter, 5, Furnival Street, E.C., who also publish the Year-Book of Photography for 1892, and will collect accounts connected therewith.

Among the few places where civilised man has not yet planted his booted foot are certain districts in the interior of Australia. There have not been lacking bold adventurers who have essayed the task of exploring this *terra incognita*, but they have nearly all been driven back by the absence of that first necessary of life—water; or have battled on and have never been heard of more. Such was the fate of Ludwig Leichardt, who started in 1848 upon these arid lands. A recent expedition was fitted out by Sir Thomas Elder, the object being to explore the undiscovered parts of central and northern Australia. This little band of explorers, numbering only ten men, have now returned from their wanderings, and one of the party, we are glad to learn, has brought back a collection of photographs of the country which they passed through.

The observations of this Australian expedition corroborate the reports of previous travellers with regard to the want of water. For thirty-four days they and their camels could not replenish their meagre store of the precious fluid; so that if the photographer of the party had had to depend upon the old wet process for his negatives, he would most surely have come back with an empty bag. Here is another feather in the cap of the gelatine process. These photographs, which we trust will reach England, will be full of interest. We presume that the aborigines did not prove very tractable subjects before the camera, for they showed fight when the expedition approached them, and, owing to linguistic difficulties, the white men could hold no converse with them.

The County Councils, having to spend a large sum of money on technical education, are making a beginning by appointing lecturers to help in the work, and as these gentlemen will make use of the lantern as an aid to demonstration, a first edition of lantern slides, comprising twelve new sets, has just been published by Messrs. Newton, of Fleet Street. The subjects dealt with are confined to agriculture, and we only trust that friend Hodge will succeed in assimilating all the good fare thus provided for him. He will now for the first time learn that pasture grasses number about fifty varieties, with names—well, that are by no means comprised in words of four letters; that weeds, under "technical" treatment, assume alarming forms (as a case in point, he will find the common field dock christened *Rumex Obtusifolius*); and that all kinds of familiar things have in reality fearfully long names, and that all his life he has been calling them Tom, Dick, and Harry. What a happy man ought Hodge to be in this year of grace 1891.

Three of the prominent *Punch* artists are greatly indebted to photography. Mr. Linley Sambourne, in his article on "Political Cartoons" in the *Magazine of Art*, says: "I am always at work, directly or indirectly, accumulating materials by sketching or photography for possible contingencies." Mr. Sambourne, as some may know, is a skilful photographer, and was, we believe, a pupil of Mr. Valentine Blanchard. Mr. Harry Furniss is another photographer. Like Mr. Sambourne, he is constantly collecting material. One of his models is naturally a very graceful poser. He allows her to take what attitudes she chooses, photographs her, and in this way acquires an infinite variety of positions, which come in very useful when wanted. Mr. Du Maurier is not a photographer, but owes his ability not a little to the camera. When, some years ago, his eyesight failed him, it was feared he would have to relinquish the pencil. Somebody, however, suggested that he should draw his pictures four or five times larger than required, and have them photographed down. He adopted this plan, and carries it out to this day. His drawings, it may be mentioned, are photographed direct on to the block and then cut, so that all the original lines are preserved.

Royal and princely personages, when they contemplate getting engaged, should really give timely notice to the photographers beforehand. Owing to the non-observance of this very reasonable precaution, not a photographic print dealer in London has been able to meet the demand for portraits of the Princess Victoria May. Photographs of the Duke of Clarence were, of course, plentiful enough, but these were not what the public wanted. It was the lady everybody desired to see. And the public is critical now-a-days. It cannot endure a portrait of a lady celebrity which has a *soupçon* of out-of-date about it. The dress, the style of hair, must be of the very latest fashion if the photograph is to sell. Of course this entails frequent visits to the studio, but so much the better for the photographer.

A writer in a provincial paper has lately been criticising the efforts of amateurs who go in for lantern slides. He complains that the subjects are, as a rule, not only tame and monotonous, but unsuitable. He calls to mind views showing an expanse of thirty or forty miles with everything "beautifully sharp"—the only merit they possess. Another is a picture of some holiday resort, its attractions lying, according to the exhibitor, in its being possible to count all the roofs and chimneys in the village. Ruined buildings are also well to the front, but of no interest to anyone, save to those who believe in the "beautifully sharp." In portraiture the amateurs are no more successful. The average group is arranged in line like an awkward squad of youthful volunteers who are trying to stand at attention. These also are perfectly sharp in focus. If the sitters are in a boat, the latter is placed broadside on, with its lines parallel to the banks of the river, and the whole is microscopically in focus.

The writer gives a number of other examples, but we need not quote them. The moral seems to be that if artistic arrangement be necessary to make ordinary photographs pleasing, it is still more so when the photograph has to be enlarged and thrown on the screen. The spectator is not bound to take a photograph in his hand, or look at it on a wall, but he cannot well escape seeing it when it forms the only illuminated object in a darkened room. We are afraid that many amateur lantern operators have caused their audiences a few miserable and dreary half-hours.

## LEEDS INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

By Our Special Commissioner.

[second notice.]

The south room is the principal one of the suite devoted to this Exhibition, and really forms a most imposing gallery, and in this are given the lantern entertainments, which form an important feature of the scheme. The wall devoted to the champion class is very effective, for there is the variety due to contrast. The remarkable series of portraits of the Scotch judges, by Mr. W. Crooke, which have gained the gold medal, occupy a distinguished place, though they do not hang all together as they did at Glasgow, and are, therefore, not quite so striking. That very ambitious attempt by Mr. A. W. Wilson, called "The Seven Ages of Man," also is on view here, and must be interesting to many who have not seen the series before. There are seven pictures of large size dealing with the life of man "from dawn to sunset," and, when the difficulties are fairly considered, the whole must be considered as a remarkable achievement. I believe I am right in saying that these pictures were produced before the advent of gelatine. If it be so, then the effort is still more remarkable.

Mr. H. P. Robinson is not well represented by "Gossip on the Beach." Why did he not send "Carolling"? Mr. Sutcliffe is well to the fore with a number of his well-known subjects, including "*Stern* Reality" and "Water Rats." Of course, all the pictures in this class are more or less known, and have been described before. I have just said that the champion wall is very effective. I wish I could say the same of its opposite neighbour. This dreadful class distinction makes effective hanging of pictures almost impossible, and in consequence the best wall in the Exhibition is spoiled by a monotony of effect that is almost overwhelming. When it is known that landscape under whole-plate is a large class, and occupies an important slice of this wall, the reason for this monotony is not far to seek.

Mr. Carl Greger is certainly a most promising artist, and is equally successful in various domains of art. His "Suffolk Mill" is a very striking picture made out of slender materials; only a windmill—and that not of the old picturesque wooden post mill so dearly loved by Turner and Girtin in the past, but a brick one of the modern tall, round pattern, more like a lighthouse with six arms than a mill—a sedge-lined stream; and distance, remarkable chiefly for its monotonous outline. The mill stands out dark and frowning against the evening sky, and the long streaks of light in the clouds repeat with marked effect the lines of the sombre landscape. The "Evening Studies in the Thames Valley," by Mr. P. Ennis, are also very artistic. One is evidently taken in the gloaming, for there is no detail in the dark masses of foliage, and yet the effect is not due to under-exposure, but absence of light. In another—a bit of muddy Thames shore—the artist has not been quite so happy. A small boat makes a dark spot in the centre of the picture, and comes, unfortunately, immediately under the principal light in the sky. It is a good illustration of the difficulties that beset the paths of the artistic photographer. Now a painter would have removed that boat without employing a waterman; or, at any rate, he would have taken care that it did not drift into his picture.

"An Old-Time Garden," by Mr. T. Dawson, is worthy of notice, and he is to be complimented on the artistic employment of the picturesque materials placed in his way. It has evidently been a grand garden in palmy days, but is probably far more beautiful in its present decay. There are indications of renaissance architecture of a monumental character in the distance, and the picture is framed in by an arch overhead, whilst a black and white marble path running away in perspective carries the eye to a stately dame who is gathering roses in the middle distance. The uplifted arms give additional grace to the pose of the figure, and a basket by her side half-filled with flowers gives support to the composition. In a picture so artistic, why was not something done to prevent the halation in its upper part?

Sandsend is evidently a pretty spot, and in one at least Mr. A. A. Pearson has made good use of his materials. A four-arched bridge spans a shallow stream, but the accumulation of well-worn stones on each side of the summer rivulet clearly indicates its potentiality during winter storms. Quaint little cottages line the further bank, and steep hills form a background to the scene.

Mr. Godfrey Bingley has been very successful with several of his views, but the palm has been given to "Beddgelert," for he carries off the silver medal offered by the Leeds Photographic Society for the best picture produced by one of its members. The subject is a famous one, and has been constantly photographed ever since photography became an art, but he has been singularly fortunate in the selection of the right moment, for both time and weather have been on his side. The picture is atmospheric in a striking degree, and the clouds are exactly in the right place, and yet they appear to belong to the picture, and do not seem to have been added afterwards. This is certainly one of the best landscape photographs in the Exhibition. Mr. Bingley has been more than lucky, for he also takes the bronze medal offered by this Society for the best set of four executed by one of its members.

Mr. Horsley Hinton is represented by several fresh pictures, and in addition sends some of those that have been distinguished by medals at former exhibitions. I am compelled to say I do not like this perpetual fiddling on one string. The same fault unfortunately exists amongst the painters. A man gets talked about for some quality that is recognised as fresh, and straightway he goes on year after year, reproducing the same with only slight modifications, until one can recognise his pictures a mile off. Now, Mr. Hinton has made a distinct mark; but I am anxious to see him deal with nature in some of her gayer moods. "October" is all very well, but let us have the "merry, merry spring-time" the next time he exhibits.

Mr. Patterson Gibson knows how to deal with brawling brooks and silver streams, and his selections of hour and season prove him to be an artistic photographer of no ordinary calibre. In one of his pictures, composed of woods and swiftly running water, a few dark stones, artfully selected so as to come in the right spot for effect, absolutely make the picture.

Mr. F. Sutcliffe's "Bend of the Road" is a capital illustration of what can be done by an artist with slight material. The picture is unusually low in tone, and was evidently taken some time after sunset, for there is little detail, and it owes its effect to the solid massing of light and shade. "The Quay Side" is a group of Scotch luggers at rest. The rippled reflections and shadows are extremely beautiful in this picture.

Mr. W. C. Beetham's "Haunt of the Moor Hen" and

"At Work by the River" well deserve the special silver medal awarded to them. The first is, perhaps, the best landscape in the Exhibition. It is of large size, but it commands attention not so much for this important factor as for its strikingly artistic quality. A still stream, with delicate shadows from the foliage on its banks, winds away behind a mass of trees which stand out strong and bold in the right of the picture. The focus of light comes just where the water disappears behind the trees. This contrast makes the picture very strong in effect, though delicacy of detail pervades it everywhere. The second picture is also worthy of notice. Men and farm-horses are returning from work along the bank of a stream. They stand out in bold relief, and appear to be coming towards the beholder.

Mr. Paul Lange's pictures of hoar-frost are well hung, and at once strike the eye. They are marked "not for competition."

## EXHIBITION AT THE PHOTOGRAPHIC SOCIETY OF IRELAND.

An interesting exhibition of members' work was opened in the rooms of this Society at 15, Dawson Street, Dublin, on Monday, 7th inst., and remained open every evening during the week. The number of pictures sent in was considerable—over 400—and represented that pleasing variety of subject, treatment, and process which is only to be met with in an exhibition the work of which is almost wholly confined to amateurs. The walls were completely covered by the work of the members, and amongst those which attracted special attention were two fine enlargements of the president and past president, Mr. Geo. Mansfield and Sir Howard Grubb, F.R.S., respectively. These were lent by Mr. A. Werner, an active member on the council of the Society. Some large direct pictures by Mr. George Mansfield were highly admired. A frame of drawing room and other interiors by Miss White received universal praise. In the competition in connection with the exhibition, the prizes were awarded as follows:—

| | | |
|---|---|---|
| Enlargements ... ... ... ... | | R. M. Inglis |
| Views ... ... ... ... ... | | J. White |
| Hand-Camera Work ... ... ... | | J. White |
| Historical Pictures... | (Recommended) | L. R. Strangways |
| Lantern Slides ... ... | (1st) | J. H. Hargrave |
| " " ... ... | (2nd) | L. R. Strangways |

A set of 100 quarter-plate views in platinum of a tour in Norway, lent by Mr. William Swanston, president of the Ulster Photographic Society, attracted much attention on account of their uniformity, fineness of detail, and knowledge of art brought to bear upon the formation of the pictures. Amongst those frames deserving special mention may be set down the work of Messrs. A. M. Geddis, M. Hedley, R. M. Inglis, N. Colgan, J. Kelsall, J. White, J. A. C. Ruthven, F. H. Orr, and L. R. Strangways. Amongst the trade exhibits may be mentioned a window transparency, and a couple of beautiful examples of printing on silk in the diazotype process, lent by Messrs. Green, Cross, Bevan, and Co., and also a sample of the work of the Celerotype Company.

The annual lantern exhibition was held in the Leinster Lecture Hall, Molesworth Street, on Friday evening, and was witnessed by a crowded audience, when upwards of 220 slides, including the prize slides, were passed through the lantern by Messrs. J. H. Hargrave, M. Hedley, and J. A. C. Ruthven.

On the whole, the exhibition may be declared a splendid success, a state of things which was mainly due to the indefatigable exertions of Mr. Hargrave, the popular hon. secretary, and of Mr. A. M. Geddis, who, as members of the hanging committee, had the entire work of the exhibition thrown on to them, in consequence of the unavoidable absence, through illness, of the other two members of the hanging committee.

## TAKING PICTURES FOR A NICKEL.

A new automatic flash-picture apparatus is thus described in an American paper under the above heading:—

An invention that is almost human in its workings is the new automatic photographing machine that, for a nickel, will take your picture while you wait. It is like one of the weighing machines, standing upright in the manner of the old-style clocks. It has two big eyes which stare at you while you sit in the chair as if they would divine your secret thoughts. These eyes are the apertures through which the flash-light effects are secured. The operation by which the counterfeit presentments are taken may not be uninteresting. You are placed in a chair in front of the machine. Back of the chair is the old-style head support that makes the sitting for a photograph so tedious for a moment or two. The young lady attendant—this device opens a new field for young women ambitious to work—first pushes your chin in one direction, and then pulls it in the other direction until your face is in the proper position. Then she looks at you and smiles, which is the signal to look pleasant. When the proper beatific expression has settled down upon your features she presses a button. There is a rumbling noise inside, yet you continue to glare at the two eyes in spite of the inward commotion, for you have been told what to do. In a few seconds there is a brilliant glare as if another Sodom and Gomorroh were being destroyed, the noise ceases, and the negative drops into the pan, whence the young woman takes it out. But she does not show it to you, because nothing can be seen until it is placed in the solution. This is done, and little by little the features, appear until you "see yourself as others see you." Ten chances to one you are dissatisfied with the picture, for the bright electric flash-light so blinds your eyes, and your optical muscles are so contracted, that an expression is there that makes you look like a pickpocket or ornament for the rogues' gallery. Nevertheless, it is a wonderful invention, and curious people will not be slow to drop into the slot the nimble nickel.

## AMATEURS.

According to a correspondent of the *Times*, the modern amateur is by no means confined to the art of photography. He writes thus:—

"We are in the power of an organised oligarchy of amateurs, entrenched behind a mighty fortress of 'system.' That is the normal English state of things in these days; for now is the great age of the amateur. He reigns supreme everywhere. The House of Commons consists of a mass of amateur legislators. Amateurs, wild with fads, pervade our county councils. Amateur educationalists control the school boards. Committees of amateurs rule our hospitals and all the institutions of this country that are not conspicuous successes. The Army itself is a machine for turning out on us, in the prime of their life, a mass of amateur civilians, who are forced to find employment as amateur directors of companies, amateur wine-merchants, amateur tradesmen; or to fill other posts for which their professional career has not tended to fit them. The walls of our exhibitions are covered with amateur pictures. Committees of amateurs preside over the erection of public buildings and monumental statues. Amateur authors write half our literature. Amateur actors flood the stage. Amateur musicians rival the cats on the housetops in number and cacophony. Amateur working-men organise strikes. Amateur clergy do three-quarters of the preaching. Amateur prophets reveal a succession of new religions. It is the English latter-day manner of doing things. We should be inconsistent if we did not get landsmen to manage the navy and civilians to organise the army. If we keep going at all, it is thanks to the energy of amateur critics."

## Short Notices of Books.

Electricity up to Date, for Light, Power, and Traction. By John B. Verity, M. Inst. C.E. (*London: Warne and Co.*)

All methods of obtaining light must necessarily be of interest to photographers, and the above work has several chapters which in this connection have some useful suggestions.

Die Photographische Messkunst, oder Photogrammetrie Bildmesskunst, Photographie. By Franz Schiffner. (*Halle a S.: Wilhelm Knapp.*)

The book opens with a brief account of the work of various experimentalists, and then proceeds to give detailed directions in connection with the applications of photography to topography. It is is divided into three sections, the first of which comprises useful instruction for beginners; the second deals with the apparatus employed, and the methods adopted by various experimentalists; and the third section is devoted to advanced students. The book, thus fully dealing with the subject, consists of 134 pages, with 83 illustrations.

Die Autotypie in ihren verschiedenen Ausfuhrungsarten. By J. O. Morch. (*Dusseldorf: Ed. Liesegang.*)

A practical treatise on the application of photo-mechanical processes to book illustration, &c. The author is well known in connection with his "Handbuch der Chemigraphic und Photochemigraphic," and brings to bear on the book before us the results of a wide practical experience. Eight well-executed plates, with full letterpress description of their production, increase the value of a useful book.

Photographischer Almanach und Kalender fur das Jahr 1892. (*Same Publisher.*)

In comparison with the bulky annuals issued in England for one shilling, the above seems to give but small measure for one mark. But though little, this annual is, as usual, good so far as it goes. The articles are short, but practical. Among the illustrations are portraits, with biographical notices, of Ottomar Anschutz, Edmond Becquerel, and Dr. Jos. Petzval. Useful features in the issue of 1891 are repeated, with the addition of a list of dark rooms for continental tourists.

Photographic Club.—Subject for December 23rd, "Washing Prints"; December 30th, monthly lantern meeting.

## Patent Intelligence.

*Specially compiled for the Photographic News by Herbert & Co. (H. J. Haddan & R. Haddan), Registered Patent Agents, &c., of 18, Buckingham Street, Strand, London, W.C.*

### Applications for Letters Patent.

20,951. Samuel Henry Smith, 21, Finsbury Pavement, London, "Improved Photographic Plate Washer."—*December 1st.*

20,988. Hugo Kassel and Ernst Kassel, 37, Chancery Lane, London, "A Combined Purse or Pocket Book and Photographic Camera."—*December 1st.*

21,176. Herbert Samuel Starnes and Andrew Pringle, Cromwell House, Bexley Heath, Kent, "Photographic Exposure Shutter."—*December 4th.*

21,195. Fox Shew, 23, Southampton Buildings, London, "Improvements in Photographic Printing Frames" (partly communicated to him from abroad by M. Lehmann, France).—*December 4th.*

21,233. Arthur Charles Smith, 258, Albert Road, Peckham, "Improvements in Photographic Cameras."—*December 5th.*

21,274. Zygmunt Ajdukiewiez, 28, Southampton Buildings, London, "Photographic Camera for Instantaneous and Prolonged Exposures."—*December 5th.*

### Specifications Published.

18,723. *May 20th*, 1890.—"Photographic Plates." A. Toby, of 47, Rue de l'Hopital, Brussels, Belgium.

The object of this invention is mechanism for the automatic change of plates in photographic apparatus. The apparatus is provided with a system of change of plates, consisting of turning mechanism, and mechanism for rectilineal motion, which together cause the plate presented vertically to the object to make a quarter-turn, which places it first horizontally above, whence it is withdrawn backwards parallel to itself to take position above a pile of other plates, while, at the same time, a fresh plate is advanced from below this pile to be turned up vertically before the object, and to follow the same course as the preceding plate when the operator has taken the picture. The turning mechanism consists in the combination of two grooved frames with a turning frame, to which they are connected in alternate manner by links, whilst S-shaped springs bear them against horizontal and vertical guides in the compartment in which it is arranged, this compartment being situated exactly in front of that containing the pile of plates. The mechanism for rectilineal movement consists in a system of levers connected by links to upper and lower slide bars, acting by tappets on the plate to be changed in opposite directions, so as to move the one which has served back on to the pile in the hinder compartment, and to push a fresh plate forward into the frame placed exactly facing the lowest plate on the pile. The movements of the mechanism are produced by working a handle or button outside the apparatus.

## Correspondence.

### THE CHICAGO EXHIBITION.

Sir,—Some little time ago my attention was drawn to the fact that the classification for the Chicago Exhibition did not provide for the exhibition of photographs. I wrote on the subject to the director-general at Chicago, and he now informs me that the classification has recently been revised, and is now in process of publication. Photographs will be included in the group devoted to instruments of precision, experiment, research, and photography. They will thus be in the Department of Liberal Arts, and not, as at Philadelphia in 1876, in the Fine Arts Department. H. T. Wood, *Secretary.*

*Society of Arts, John Street, Adelphi, Dec. 14th.*

### PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Sir,—It has been arranged that, during the present winter, a series of lectures shall be delivered under the auspices of the Photographic Society of Great Britain, upon subjects of interest to photographers, with a view to the development of a scheme of photographic technical instruction of a more advanced character than that provided by elementary schools.

Should the present experiment prove sufficiently successful to show that further efforts are likely to result in material benefit to the photographic community, without unduly taxing the resources of the Society, it is intended to consider the details during the summer in order to elaborate a more complete programme for next winter than is now possible. It is not, perhaps, too much to hope that the present movement may prove a modest beginning of a National Photographic Institute.

The lectures now arranged will be delivered at the Society's rooms, 50, Great Russell Street, on Tuesday, Jan. 5th, 1892, by Mr. T. Bolas, F.I.C., F.C.S., on "The Relations of Photography to the Industrial Arts"; on Tuesday, Jan. 19th, by Mr. Chapman Jones, F.I.C., F.C.S., on "The Distortion of Outline in Photography"; and on Tuesday, Feb. 2nd, by Prof. R. Meldola, F.R.S., &c., on "Photography as a Branch of Technology."

Admission will be by ticket, to be obtained on application to the assistant secretary of the Society. The number issued will be necessarily limited, on account of the small space available, and preference will be given to applicants who are members of the Society or of affiliated societies. Any surplus will be given to other applicants in order of application. A stamped directed envelope should be enclosed. Further particulars will be duly announced. H. A. Lawrance, *Assistant Secretary.*

50, *Great Russell Street, W.C., Dec.* 15*th.*

---

## NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

Sir,—The proceedings of the Council of the above Association, November 9th and 10th, 1891, Anderton's Hotel, Fleet Street, were duly reported, by your kind favour, in your issue of November 20th, 1891, page 804.

A decision was then come to by the Council and members of the profession to deal only with those firms of "enlargers" who issued a "trade list" not putting the promiscuous public and amateurs on the same terms as the professional photographers; but protecting the latter in a fair, just, and business-like manner.

The profession will be pleased to learn that already the following firms have complied with the respectfully urged request of the Council, viz.:—Messrs. Elliott and Son, Barnet; Autotype Co., New Oxford Street; Marion and Co., Soho Square; Eastman and Co., Oxford Street; Illingworth and Co., Sheriff Road. The Council will be glad to receive the additional consent of all respectable firms to be added to the above list.

I beg to urge upon all professional photographers the importance of becoming members of this Association (formed for the defence of their own interests), and that they should speedily communicate with me for that purpose.

D. J. O'Neill, *Secretary.*

47, *Charlotte Road, Birmingham, December* 12*th.*

---

## PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Sir,—Will you permit me to say that, in response to private appeals, I have been favoured with several contributions during the last and present months, but I am sure that some intending donors are amongst those who have not yet replied; and, by your favour, I should like to remind them that the accounts must be closed for audit at the end of the year, so that the hon. secretary, Mr. H. J. Beasley, of 65, Chancery Lane, and myself are most anxious to get in all donations and outstanding subscriptions during the next fortnight.

Thanking you by anticipation for your kind insertion of this letter. John Spiller, Treas. P.B.A.

2, *St. Mary's Road, Canonbury, N., Dec.* 16*th.*

---

## DR. MADDOX AND DRY-PLATE PHOTOGRAPHY.

Sir,—"All honour" to the News for affording means for the ventilation of a question which very much stands in need of having a little air and daylight let in upon it. In a matter of this kind, praise should be accorded "without stint."

In your last week's issue, Mr. Pringle was obliged to have recourse to *modifications made five years ago*, and mentioned (unfortunately, I think) by Mr. Debenham at a meeting of the London and Provincial Photographic Society, when an appeal was being made on behalf of the Maddox testimonial. If Mr. Debenham had taken Harrison's formula of 1868, instead of Maddox's of 1871, no such modification would have been necessary as that which Mr. Debenham mentioned, but did not describe.

With respect to "Professional's" remark asking why no credit is given to Mr. Bennett, all that can be said is that, at present, Dr. Maddox has got the whole of it, so that there is none available for any other person. When the proper time comes, it may be shown who are responsible for a state of things which is a disgrace to photography. Meanwhile "Professional" may rest assured that Mr. Bennett will eventually come by his own, but that will only be *after* credit has been given to Mr. Burgess for the plate which he (not Dr. Maddox) put into Mr. Bennett's hands. With regard to "Professional's" other remark, it may be said that history records the fact that very rapid plates (not infinitely rapid) were made before 1878—the year in which Mr. Bennett's most valuable announcement was published—and it is also recorded that professionals were very prejudiced against the dry plate, even for some years after 1878. If I may be allowed to say it, "Professional" seems still to have some of the old love left.

It would not be a bad thing for societies to form an idea of the relative values of these early experiments by actually repeating them. I wonder if Mr. Pringle has done this. Let there be no modification, but let it be work, fair, square, and above-board.

Now for something much more serious, and which had better be settled by photographers than by those outside photography. How is it that Mr. Burgess is pursued by certain parties with such animosity? I find this to be the case in 1873, in 1880, and, to a certain extent, now in 1891. Why is it? Surely there must be something behind the scenes of which we spectators are not cognisant. Why is every opportunity taken to insult him? Is not this kind of thing a disgrace to all concerned? It will be time enough for any gentleman to mention "bars" when an application is made on behalf of Mr. Burgess for such recognition as that to which Mr. Pringle gratuitously refers. Still, if ever it should be necessary to make an appeal, and should anyone wish to respond, no bar that Mr. Pringle or any other person might choose to set up could prevent the exercise of one's own free will. Before this question is done with, something will have to be said with reference to the unwritten law which seems to prevail, and which arbitrarily devises "bars" and inflicts penalties. What bar has it been to Foley, Arkwright, Dolland, Whitworth, Millais, Tennyson, and the whole world of inventors, that they have made a profit by their work?

Should anyone be anxious to know what Mr. Burgess did, let him consider the condition of emulsion affairs at the beginning of July, 1873; the condition was that of darkness, thick as night. Then let him compare this state with the condition one month later. Within a very short time of the end of July, 1873, it is probable that every photographic journal in the world had made reference to what had been done by Mr. Burgess (not Dr. Maddox). Luckily for Mr. Burgess, the records speak out in no doubtful tones. These records, which have been exhaustively dealt with, conclusively prove:—

1. That a great and wilful wrong has been done a deserving man.
2. That the work of the man who is credited with the invention of the gelatino-bromide dry plate had no connection therewith.
3. That the work of the accredited inventor was not so good in its own line as work that had been done before.
4. That the work of the accredited inventor was worthless, and that it was so esteemed.
5. That a deliberate plot was concocted to take away the

credit of the invention from the man who overcame the difficulties which had rendered abortive all previous attempts to use gelatine, in order that the honour might be given to a friend, viz., the accredited inventor.

6. That the jurors of the Inventions Exhibition were wrongly advised in this matter.

Before concluding, it may be well to ask the following questions, the statements referred to in the first three all having appeared in public journals :—

1. Why is Dr. Maddox said to be absolutely the first man who experimented with gelatine associated with silver ?

2. Why is he called the father of the gelatino-bromide dry plate ?

3. Why are we said to owe more to him than to any other man for the dry plate of to-day.

4. Why was he alone awarded a gold medal by the jurors of the Inventions Exhibition ?

5. Where did the negatives come from which were exhibited on behalf of Dr. Maddox at the Inventions Exhibition ?

In view of the fact that both in the Doctor's account of his experiment and in the only editorial notice devoted to it, the process is described as a printing process ; together with the great difficulty, if not impossibility, of obtaining a negative by it, the last question attains a special significance.

This question promises to develop into a very serious affair, and one that is likely to create a great sensation.

*Peckham Technical School.* J. Faulkner.

---

Sir,—My attention having been called by a friend to certain statements made against my claim *re* gelatino-bromide in your pages, may I ask the favour of the insertion of the following reply in your next issue.

I have this morning received from the publishers your journals dating from the 20th ult. to the 11th Dec., inclusive. Let me hope this will explain what otherwise must seem strange to your readers—viz., that I had not earlier intervened in the correspondence that has occurred between those dates about the discovery of the gelatino-bromide process, and my original article in the *British Journal of Photography* in Sept., 1871. As further silence might be misconstrued, I hasten to contradict what has been mis-stated. I should have preferred to let the letters of some of your correspondents pass for what they are worth, as I consider Mr. Pringle, of whose letters I was wholly ignorant until to-day, has righted much, if not entirely, the endeavour to set aside my claim.

It is stated Dr. Maddox only obtained prints, not negatives. This is *untrue*. Negatives were made, and some of the original negatives Mr. Bolton and I found amongst the dirty glass some years since at No. 2, York Street, Covent Garden. Finding I was very much occupied and exceedingly out of health, some of the negatives that were made were shown to one of the members of a firm at Southampton, and solicited to continue the experiments. Unfortunately, it transpired that they were too busy to accord the necessary time. I hold a letter from that gentleman dated some years afterwards recalling to mind this fact.

That I did consider the process of value, the concluding sentence to my original article clearly proves. No attempt, in my hurried reply to Mr. Taylor's request, was made to state more than a few facts. The editor's remarks at the time suffice to show his estimation of the article sent to him. Other experiments followed closely, as time and health permitted, the chief being a little more care, increase of bromide, and the introduction of various organic bodies which were found to vary greatly the colour of the resulting negative. All this was done before the end of the year ; hence *long, long* before we were introduced to the guinea advertisement. Some of the negatives have been exhibited, and are still in my possession. It is therefore a mistake to suppose that my original hurried article contained all that I had done, or that only positives on paper or on glass were made. From the often hasty experiments many defects existed compared to the plates of the present day, the original object being not "speed," but a substitute for collodion. It was evident perfection could only be reached by further work.

Another point is that my article was not original, and that it was not the starting point of the present gelatino-bromide process. I can truly declare that I had never known of any previous gelatine emulsion process, or I should have quoted the same. Evidently such were in oblivion, or they would have been pointed out at the period of my article. One author, to whom I am not personally known, and who certainly is capable of judging, when writing of my original paper or process says : "It did most unquestionably exhibit the capabilities of gelatino-bromide, for the gelatine process as given by Dr. Maddox is only modified, not altered by the numerous dry plate and gelatine bromide paper manufacturers of to-day." I have never claimed what I could not substantiate, and in whatever branch of work I have endeavoured to make the slightest contribution, I have never laid claim to the work of others. If we look at the present phase of dry plate photography, it lies in a nutshell. It must be evident it had a starting point, and that starting point I claim for September, 1871, in spite of all adverse criticism. Its present perfection is not "due to one individual," nor to two, nor to ten, but to the numbers who have thrown their little into the common stock ; indeed, it is the result of the "power of littles." Personally, I can have no objection to the admirers of any special party getting up a testimonial to those who have played any part in its history, though I think the 21st birthday must be considerably retarded, and then possibly past commercial relations may be found detrimental. I read Mr. J. Burgess "advertised his gelatino-bromide emulsion, but, as it would not keep in consequence of decomposition setting in speedily, it was not commercial, therefore was unsuccessful ;" perhaps this may modify my remarks. To close this letter, I now offer my sincere thanks to those at home and abroad who have in any way expressed their testimony on my behalf. Those interested in gelatino-bromide will find a more extended notice in my letter to Mr. W. Jerome Harrison, published in his "History of Photography," which certainly fully and undoubtedly establishes all that I claim as the originator of the present gelatino-bromide process. With every apology to the editor for so largely trespassing on his pages, and craving the indulgence of a fair hearing from the readers of the News, I am, sir, yours faithfully, R. L. Maddox.

*Portswood, Southampton, December 15th, 1891.*

---

MADDOX FUND.

Unofficial list of payments and promises to December 14th :—

| | £ | s. | | £ | s. |
|---|---|---|---|---|---|
| Britannia Works Co. | 100 | 0 | F. Beasley ... ... | 1 | 1 |
| J. Carbutt ... ... | 50 | 0 | C. Dawson... ... | 1 | 1 |
| R. W. Thomas & Co. | 25 | 0 | Col. D. Durnford ... | 3 | 0 |
| The Autotype Co. ... | 10 | 0 | W. Bedford ... | 2 | 0 |
| Nelson, Dale, & Co. | 10 | 10 | H. M. Hastings ... | 1 | 1 |
| *Photography* ... | 10 | 10 | Manchester Amateur Photo. Society ... | 1 | 1 |
| Camera Club List... | 27 | 16 | H. J. Channon ... | 2 | 0 |
| J. W. Swan ... | 5 | 0 | F. Hollyer ... ... | 1 | 1 |
| F. York ... ... | 5 | 0 | R.W.E., Coll. Devonport Photo. Soc.... | 0 | 10 |
| A. L. Henderson ... | 5 | 0 | West Kent Amateur Photo. Soc. ... | 1 | 6 |
| N. Bannatyne ... | 5 | 0 | F. Lloyd ... ... | 0 | 5 |
| M. Whiting ... | 5 | 5 | | | |
| W. I. Chadwick ... | 1 | 1 | | | |
| J. B. Wellington ... | 1 | 1 | | | |

There must be many more, especially manufacturers and dealers, anxious to contribute. Andrew Pringle.

*Camera Club, Charing Cross Road, W.C.*

---

A Successful Inventor.—It is not every inventor who is so fortunate as Mr. Louis Brennan. The Admiralty have paid the last instalment of £16,000 to this gentleman, who has received much more than £110,000, which the Government is supposed to have paid for his torpedo. Eight years ago he was paid a retaining fee of £5,000, and engaged for three years at a salary of £2,000 a year and expenses, in return for which he was to devote all his time to the development and improvement of the torpedo, and when that term was over he received for some years a salary of £1,500.—*The Practical Engineer.*

## Proceedings of Societies.

London and Provincial Photographic Association.

*December 10th.*—Mr. S. G. B. Wollaston in the chair.

A question from the box was read: "What strength of bichromate of potassium solution should be used to restore plates that have been exposed to light; must they be afterwards washed, and is the origiual sensitiveness impaired; if so, by how much?"

Mr. A. Cowan said that a strength of from three to five per cent. was recommeuded. The bichromate must be thoroughly removed by washiug, and theu the plate should not have lost its original sensitiveness. Mr. Cowan also showed a set of transparencies developed with the parauidopheuol solution given by Mr. Low Serjeant. The action of the developer was very rapid, and, after developing nine lautern slide plates, he had used the same solution for a half-plate negative, which he exhibited.

Mr. W. E. Debenham found, with Mr. Cowan, that the development was rapid, but when used the day following its first use it had caused a curious set of spots all over the plate.

Mr. Sinclair said that, according to Mr. Warnerke, the hydrochloric salt of paramidopheuol was not the best one to use, aud that another of its salts was to be preferred, and was in use iu America for developiug purposes.

Mr. F. A. Bridge then read a paper on "Gas Bottles, and Methods of Ensuring Safety with them" (see page 859), iu the course of which he attributed accideuts not to the bottles themselves, but to regulators and gauges, particularly the latter. Iu a recent case which he described, the explosion was probably due to a little oil.

Mr. T. E. Freshwater said that no doubt, in all these cases, the explosions occurred in connection with gauges or regulators, and generally with the former. We are told that uo oil is used for the leather washers, but only beeswax. In a recent paper, Lieut.-Colonel Lonsdale explains the cause of explosion in gauges. The explosious were probably not caused by the mere presence of the lubricant, but by the force of the gas whirliug a little of it round and round, and the friction of the spray thus formed sufficed to cause ignition. He thought there was no necessity to buy a gauge. The amount of oxygen contained in a bottle could be found by weighing.

Mr. Spurge showed a drawing of a new gauge in which the oxygen did not enter the steel tube, but acted on a piston in communication with the tube, which was filled with glycerine. Not only was the danger of coming into contact with oil avoided, but there was less waste of oxygen in its use. He also showed the gauge in use.

Mr. A. Haddon suggested the use of phosphor bronze iustead of steel for cylinders.

Mr. G. R. Baker said that it seemed to be agreed that a small quantity of oil was the general cause of explosions, but he thought that if a valve was never tightened up until the gauge was full, there would never be any explosion. He thought a ratchet key for opening the valve would be useful.

Mr. Bridge said that with a key like that used for tuniug grand pianofortes, where the handle formed a long lever, the opening of the valve could be made very gradual.

Mr. J. Stevens was elected a member.

It was arranged that no meeting should be held on the Thursday which will be Christmas Eve.

Camera Club.

*December 10th.*—Mr. F. Cobb in the chair.

Mr. T. R. Dallmeyer gave a description of his new telephotographic lens, referring to diagrams on the board. The object is to make possible the production of very large images of distant objects without cumbersome or expensive apparatus. This is most perfectly accomplished, as was shown by some comparative examples of objects photographed respectively by a 10 by 8 rapid rectilinear lens of thirteeu inches focus, and by the new lens with the same extension of camera, the image by the "tele" lens being five times the size of those obtained by the ordinary instrument.

Some remarks were afterwards made by Messrs. Traill Taylor, Elder, Hayman, and by Dr. Fison and Dr. Lindsay Johnson.

Dr. A. H. Fison then followed with his subject, "The Application of the Optical Lantern to Scientific Illustration," and showed how, by means of the lantern, beautiful and valuable experiment could be made easily visible to a large audience in a way unattainable by other methods. His practical illustrations included some excellent photographs of scientific apparatus, and a series of experiments illustrating the subject of magnetism aud electricity.

Holborn Camera Club.

*December 12th.*—Mr. Alfred Hodges in the chair.

Mr. Arthur J. Golding gave a lecture on "Composition and Selection of Subject." The chief point in the selection of subject was what to avoid. If amateurs were to give a little more attentiou to that point, they would have a better collection of prints. Their aim should be to produce work with which they do not tire, and he maintained that a good photograph would do this. It must always appear pleasant to the eye; not on account of its beautiful shining finish, or its delightful matt surface, but because it portrayed to the eye an impression of nature which was beautiful. Amateurs should always ask themselves whether the image on the focussing screen would make a picture. He advised them to look thoroughly at the work of emiuent artists, aud try to fiud why they looked so beautiful. Mr. Goldiug impressed on those present to (1) avoid having the priucipal object in the centre of the picture; (2) avoid having the horizon in the centre; (3) avoid straight lines; (4) avoid repetitiou of lines; (5) avoid an uninterested aud unbroken foreground. He gave a few hints on the introduction of figures.

South London Photographic Society.

At the last meeting (Mr. F. W. Edwards in the chair) Mr. Henry Crouch delivered a lecture on "Lenses." The causes of spherical and chromatic aberrations, and the means of correcting these defects, were explained, as were also the conditions affecting depth of focus and flatuess of field. The lecturer stated that true perspective was obtained with a wide-angle—*i.e.*, short-focus—lens, and spoke favourably of single lenses. Specimens of Jena, crown, aud flint glass were exhibited, aud their properties discussed.

Mr. C. H. Oakden, 51, Melbourne Grove, East Dulwich, S.E., has been appointed honorary secretary *pro. tem.* in place of Mr. S. W. Garduer (resigned).

West London Photographic Society.

*December 11th.*—The President iu the chair.

Mr. Charters-White, M.R.C.S., read a paper on "Photo-Micrography." After a few preliminary remarks on the advantages of this art over that of wood engraving for illustrating technical books, the lecturer proceeded to explain one by one the various steps in the process. He showed how very simple a piece of apparatus was necessary, particularly in working with such low powers as 1½ or 2-inch objectives, to which beginners in photo-micrography should coufine themselves. After iusisting on the importance of freedom from vibration, evenness of illuminatiou, and a careful register of exposures and results, he wound up his lecture with a display of lantern slides, representing histological, eutomological, and odontological subjects, and a capital selection of photos of diatomaceæ.

Several matters of special importance to the Society were considered during the evening.

Hackney Photographic Society.

*December 10th.*—Mr. John Reynolds in the chair.

Mr. W. H. Smith gave a paper and demonstration of a new paper the Platinotype Compauy are about to bring out. It was three or four times as rapid as the silver paper, and could be developed iu a cold bath with biphosphate and oxalate of potash, using the usual hydrochloric bath as a clearer. He demonstrated the printing on this paper by artificial light, using powdered magnesium and oxy-hydrogen light. Giving an exposure of fifty seconds with this light on a negative, a fair print was obtained on development.

Messrs. T. Byrne and J. Badcock were nominated for membership.

---

Richmond Camera Club.

*December 11th.*—Mr. Cembrano in the chair.

The first business was the decision, by vote, of the "Outing Competition"—that is, for the best picture from a negative taken at one of the Club's outings during the past summer. About two dozen prints were entered, and the first place was secured by the hon. secretary, Mr. P. Ennis, with a charming little view of Kew Bridge, one of the set of four which has just gained a medal at the Leeds Exhibition.

The next function was the inauguration of the new club lantern, an excellent instrument by Ottway, the selection of which had been entrusted to the president.

Among other slides exhibited was a portrait of Niépce, reproduced by Mr. Ramsay from a wood-cut in an old French work of forty years ago.

---

Glasgow Photographic Association.

*December 3rd.*—The chair was occupied by Mr. W. Lang, junr., who read a paper from which the following is extracted:—

During the recess, several important events connected with photography have taken place. I may be allowed to refer in a word to the International Photographic Exhibition held in September in our Fine Art Galleries. It was a success in every way.

At the British Association, held in August, at Cardiff, Dr. Huggins, in his presidential address, paid the highest tribute to photography that perhaps has yet been made.

The members of the Photographic Convention attending the Bath meeting had the practical results of photography as applied to astronomy very forcibly brought before them in an astronomical lecture delivered by Mr. Taylor, when a large series of photographs of nebulæ, constellations, planets, &c., were shown by projection on the screen. Bath is classic ground for the photographer. It was in the neighbourhood of Bath that Talbot lived. The first Herschel—the father of Sir John—was also associated with the city of hot springs, and his early astronomical discoveries were made while resident there.

Developers are still increasing and multiplying, the latest addition being a salt of the chemical substance known as para-amidophenol. Those who have experimented with it place the character of the results obtained with it as being between eikonogen and hydroquinone.

Before I conclude these somewhat desultory remarks, I perhaps might refer to the lantern craze which is presently pervading all classes. There is just a chance that the thing is going to be overdone. In an article the other day in the *Baillie*, the writer was deploring the comparatively small attendance at the Water-Colour Society's Exhibition, and somewhat sarcastically added that now-a-days the public could only appreciate pictures that were shown by means of projection on a screen.

Mr. James Gardner read a paper, and gave a demonstration, on "Collotype Printing." The various stages of the process were shown, and a large collection of finished prints exhibited.

---

North London Photographic Society.

*December 15th.*—Mr. J. Traill Taylor in the chair. Mr. J. D. Slater and Mr. W. Walker were elected members of the Society.

Mr. W. Bishop (the hon. secretary), in introducing the subject of "Carbon Printing," said he was glad to have the opportunity of doing so, as he believed amateur photographers did not give the attention to this beautiful process which it deserved. Whether for the beauty and variety of its results, the simplicity of its operation, or the permanency of its prints, the process of carbon or pigment printing had much to recommend it; while the fact that almost all the working could be carried on in daylight, or full gaslight, was a great comfort and convenience. The action of bichromate of potash on gelatine was then described, and a brief history given of the process. The various operations of sensitising the tissue, printing, developing, and transferring to the final support were in turn spoken of, and the use of the actinometer in judging exposure explained. The lecture completed, the demonstration followed, a number of prints which had been exposed during the day being mounted and developed, some on glass as transparencies, some on single tr nsfer, and others on the temporary support, the final support being then attached to be stripped when dry. For the purpose of completing the demonstration, some prints which had been developed and attached to the final support the previous day, and were now dry, were stripped from the temporary support, and the result shown ready for mounting. In one case a negative film of celluloid had been used as a temporary support.

A collection of specimens of pigment printing, showing the various colours available, had been lent by the Autotype Company as illustrations. Mr. Bishop's own specimens included a proportion of failures, the causes and cure of which were explained for the information of beginners at the work. The apparatus used was of the simplest character, being mainly a number of tin dishes for holding water, and a porcelain developing dish for alum; a glass slab for mounting, a squeegee, some blotting boards, and a kettle of hot water completed the outfit.

In the conversation which followed, the Chairman referred to his carbon experiences in the early days, and cordially recommended the process.

Questions were asked from the question-box as to the cause of muddiness in a ferrous oxalate developer, and it was generally considered that it was caused by insufficient acid; and next, as to the preparation of a lead intensifier, which the chairman promised to take an opportunity of answering.

The next meeting will be a technical night, and will be held on January 5th, 1892.

---

Brixton and Clapham Camera Club.

A reception was held on the 12th inst. to inaugurate the opening of new quarters at the Clarence Rooms, 376, Cold Harbour Lane, Brixton, when some 150 members and friends were present. On the walls of the drawing-room were hung a number of pictures taken by members. There were also some portfolios containing bromide enlargements by Mr. Dresser. There was also a lantern exhibition in the new meeting room, for which the Club lantern was used. The company then returned to the drawing-room and partook of light refreshments, and the evening closed with a selection of music.

---

Birmingham Photographic Society.

*December 8th.*—Mr. F. J. Lyndon in the chair.

Mr. Taylor outlined a description of the various emulsion processes which had been brought out, and demonstrated some of the advantages attending their use, and showed some excellent results which he had obtained with the new emulsion paper of the Ilford Company. The results obtained by squeegeeing on ground glass were much admired.

Mr. W. J. Harrison followed, and confined himself to the toning and fixing of the Ilford paper, the new gelatino-chloride. He mentioned that he thought the company were well advised in bringing out the paper in the winter months, because of the necessity of using cold water if the alum bath were dispensed with. He thought that in summer alum baths would have to be used. Mr. Harrison further showed the effect which could be obtained without any toning, by simply washing and fixing; the resulting colour was very suitable for some subjects. Altogether, both speakers were very sanguine as to the success of the new paper

*December 10th.*—A meeting was held at the Midland Institute, Mr. F. S. Goode in the chair.

Mr. J. H. Pickard gave a paper on "Enlarging," and showed the method of operating. He first used a Griffith's enlarging camera—one 10 by 8 fixed focus, and a second 12 by 10 adjusting focus—using "Ilford" rapid paper and a Hibbert flash-lamp. Some good results were obtained and shown. Afterwards, with an Eastman lantern, and their new rapid paper—replacing their oil lamp by magnesium ribbon on account of time—he produced from a quarter-plate negative a 15 by 12 enlargement. The ribbon used was about sixteen inches of ordinary gauge. Mr. Pickard toned with uranium, and satisfactory results were obtained.

*December* 11*th*.—The lantern slides sent by the California Camera Club were shown before a large meeting by Messrs. Harrison and Jacques, the latter operating the lantern. Many of the slides were of great technical merit and interest, being taken chiefly in the Yosemite Valley.

The Warwickshire Survey Section of the Society has lately been busy organising the work to be done during next season. The results so far obtained have given much satisfaction to the members who initiated the movement.

DERBY PHOTOGRAPHIC SOCIETY.

A MEETING was held on Tuesday evening last at Smith's Restaurant, Victoria Street.

Mr. THOS. SCOTTON gave a paper entitled "A Trip to the Isle of Man," illustrated with the lantern.

A series of "Isle of Man" slides was also shown by Mr. R. L. Warham, and miscellaneous sets by Messrs. Rowney and Smith.

Mr. J. A. Panton was elected a member.

ROTHERHAM PHOTOGRAPHIC SOCIETY.

AT a meeting on December 8th, Mr. JAMES LEADBEATER read a paper entitled "A Peep into Nature through the Microscope Lantern." The various objects on the micro slides were projected on a screen having a disc eight feet in diameter. The lantern attachment to enable this operation to be successfully performed has been designed by Mr. Leadbeater himself. By its means several objectives can be in readiness for service, and a single movement is all that is necessary to bring any one of them into operation; provision is always made for quick centreing and focussing by rack-and-pinion. Not the least interesting part of the proceedings was the exhibition of the specimens of insects, &c., under various powers.

CROMWELL PHOTOGRAPHIC CLUB (GREAT YARMOUTH).

AT the meeting held on the 14th inst. several influential gentlemen were elected members, amongst them being the Mayor of the borough (Mr. F. Burton), the Vicar (Rev. W. Donne), Mr. F. Danby Palmer, D.L., and Mr. Thos. L. Olley.

During the evening the secretary (Mr. RUMBOLD) gave an explanation of the camera and the mode of working it, for the information of beginners. After going through the method of focussing an object on the ground glass, the placing of plates in the dark slide, and explaining both time and instantaneous exposures, he developed a plate that had previously been exposed, using for his developer pyro and soda.

The next monthly meeting, to be held on January 11th, 1892, will be devoted to printing and toning of albumenised paper.

NEW PROCESS FOR THE MANUFACTURE OF CHROMATES.—The author describes the following process, which is based on the fact that when chromium oxide is heated with a mixture of calcium chloride and oxide, a chromite is formed, which absorbs oxygen from the air to yield a calcium chromate. The finely powdered mineral is mixed with a paste composed of lime, calcium carbonate, and a concentrated solution of calcium chloride, in such proportion that the lime and calcium carbonate are slightly in excess of the amount necessary to combine with the chromium oxide present, whilst the calcium chloride is about one-third of the total lime used. The mixture, on exposure to air, hardens, and is moulded into bricks, which are dried, and subsequently roasted at a temperature sufficient to convert the calcium carbonate into lime. The bricks are exposed to the action of the air for about a month, then lixiviated with hot water to remove the calcium chloride, and the residue containing the calcium chromate is treated with alkali carbonate or sulphuric acid in the usual way, according as an alkali chromate or chromic acid is required.—*Journal of the Chemical Society.*

## Answers to Correspondents.

All Advertisements and communications relating to money matters, or to the sale of the paper, should be addressed to the Publishers of the PHOTOGRAPHIC NEWS, Messrs. Piper & Carter, 5, Furnival Street, London.

All other Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.

*** *As the* PHOTOGRAPHIC NEWS *will go to press one day earlier than usual next week, all communications should be sent in not later than Tuesday.*

DRAUGHTSMAN.—Stevens's ebony stain is used by many for making drawings for process work. It flows easily from the pen, and never clogs; but it has the disadvantage of showing through any markings in white which may be superposed either for purposes of effect or in order to obliterate any portions of the black work. Wolff's liquid Chinese ink possesses all the advantages, without this demerit of the stain, and its employment is, therefore, preferable. The stain is often used because it is about one-tenth of the price of the Chinese ink.

K.—An hydraulic press is generally used for the Woodburytype process, but a backed electrotype mould will serve the purpose. Look up your text-books, where you will find details of working.

L. P.—The estimate of which you enclose a copy is by no means an excessive one. Checking it by what we ourselves have paid for the same description of work, we find it decidedly favourable.

BENEVENUTO.—The apparatus is of no practical value, and you would find it a "white elephant" on your hands. Still, it shows an experiment which is full of scientific interest, and for that reason its originator deserves much credit.

CURMUDGEON.—We are under the impression that if you want to protect the whole set of pictures you must pay the shilling registration fee for every one of them; but the rule may possibly have been relaxed. An enquiry at Stationers' Hall Court would satisfy you on this point.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—December 24th, no meeting; December 31st, "Warm Tones in Lantern Slides"; January 7th, a paper by Mr. P. H. Newman on "Some Recent Exhibitions." Visitors are invited.

WEST LONDON PHOTOGRAPHIC SOCIETY.—A conversazione and exhibition of members' work will be held on the 8th and 9th of January, 1892, at the Lecture Hall, Broadway, Hammersmith. Mr. H. P. Robinson, Mr. Valentine Blanchard, and Mr. G. E. Cooke will act as judges.

ACTION OF LIGHT ON SILVER CHLORIDE.—When silver chloride, spread in thin layers upon glass slips, is exposed to light, there is at first no darkening or loss of weight; but if it is treated at this stage with a photographic developer, such as ferrous oxalate, it is reduced to the metallic state, showing that a modification has taken place in its constitution. A similar modification is stated to be brought about by boiling silver chloride with water in a reflux apparatus in the dark for some hours. The disengagement of chlorine may be rendered evident by concentrating a beam of sunlight on the chloride. The residual product in the early stages of the action is stated to be silver sub-chloride, $Ag_2Cl$, identical with that prepared from the sub-fluoride; if treated with ammonia or potassium cyanide, metallic silver is left, but dilute nitric acid does not dissolve it. The author states that he has found that the formation of this sub-chloride from the chloride is attended with absorption of heat = 28·7 cal., and considers that this explains the increased rapidity of the action when substances capable of absorbing chlorine, and giving up heat, are present. Silver sub-chloride, prepared in either of the above ways, is decomposed by the further action of light into silver and chlorine. Since both the metal and its sub-chloride are opaque, the final product of the action of light on a layer of silver chloride usually consists of an upper layer of metallic silver, an intermediate layer of sub-chloride, and a lower layer of unchanged chloride.—*Journal of the Chemical Society.*

# THE PHOTOGRAPHIC NEWS.

EDITED BY T. C. HEPWORTH, F.C.S.

Vol. XXXV. No. 1738.—*December* 25, 1891.

CONTENTS.



## THE YEAR THAT'S AWA'.

In this, our last issue of the year, it is appropriate, and will not be uninstructive, we hope, to review in a discursive way the history of the past twelve months, to put on record the achievements and the enterprises by which the year has been marked.

The year 1891 has not been a remarkable one in the matter of either novelty or financial success, but a certain amount of good work in the experimental line has been accomplished, and, on the whole, our art has been steadily if slowly advancing. There is no doubt that the improvement in the art qualities which has been noticed for some years has, during 1891, gone on, and has in the exhibitions of the year been demonstrated. These qualities are not of a nature to rush forth suddenly into sight; their progress is, and must, from their very nature, be gradual. Three of the most successful exhibitions that have ever been held in this country have taken place during this year. It is not for us to attempt to compare these exhibitions, but we may say that Liverpool, Glasgow, and Leeds have each had a fine show of high-class work. When the Liverpool exhibition was opened it seemed unlikely that it would be approached by another so soon, yet neither the Glasgow nor the Leeds was behind the Liverpool one. The annual exhibition at Pall Mall has been, as usual, marked by a considerable quantity of the best work of the year, and by some of the worst that is hung anywhere. The latter exhibition gave rise to a very pretty storm in a tea-pot, some of the officials of the Photographic Society having put the curb on certain irregularities—real or alleged—rather too suddenly to be thoroughly understood by the victims of the new morality. The result of the ministrations of "new brooms" was a very pretty row, but in the event we hope and believe that the "affair" will be useful to the Society. In Vienna an exhibition was held during the year on new lines; the honour was to consist in getting pictures hung, and we should like to see more exhibitions on similar conditions; but there seems to have been some sort of hitch in certain of the arrangements, and without doubt a considerable amount of dissatisfaction prevails as to the administration. Still, as our readers have already been informed, it was a very fine exhibition. There have been a great many subordinate provincial exhibitions—in fact, their name is legion; we doubt, however, whether the multiplication of small shows conduces to the good of photography, and we are sure that the multiplication of medals lowers their value.

Some attempts have been made to organise institutions of the nature of trades' unions, but—perhaps happily—these efforts have not led to any important or permanent results. The Photographic Society of Great Britain has made an experiment in the direction of an affiliation scheme, intended to embrace and to draw together all the societies of the country; a certain amount of success has attended this scheme up to date, but it is too early for us to either criticise its performances or prophesy as to its future. Congresses intended to standardise formulæ and measurements used in photography have been held at Paris and at Brussels, but, so far as we see, little or no result can be said to have been attained. In our opinion, the delegates have not been sufficiently representative of practical photographers, who are the body which will surely in the end have to accept or reject the standards suggested by the congresses.

In the early part of the year, Dr. P. H. Emerson astonished us by what he was pleased to called a "renunciation" of his published theories on art. The real object of this effusion was by no means clear to the general public; some took it for a sincere recantation, some for a pretext to attack certain parties who had rendered themselves distasteful to Mr. Emerson, others for a novel kind of advertisement for some book or work supposed to be following. At all events, the renunciation was followed by some wholly inexcusable vituperation of gentlemen held very high in public estimation. The whole episode was of such a nature that we would not willingly draw more attention than necessary to it. Mr. George Davison read before the Society of Arts a paper intended to lay down the theories of the writer—and presumably of others of his school—on naturalistic art; and this was met with a somewhat long article by Mr. A. Pringle in *Photography*, wherein the writer, with considerable force, sought to combat the conclusions of Mr. Davison, and even showed that Mr. Davison's practice does not tally with his preaching. At the Camera Club a paper was read by Mr. Pennell tending to deny to photography all possibility of art qualities, and this paper called forth nothing less than a storm of remonstrance and refutation, in which many well-known photographers took part. The year has brought the usual "shave" of photography in colours, this time France having been the contributor. As usual, the affair created some little stir, especially in the lay press, but beyond this flash in the pan the subject remains just where it was. In somewhat the same direction is to be noticed a device of Mr. A. W. Scott, practically a *replica* of one by Mr. Ives, of the United States, for projecting on the "screen" images of objects in their natural colours. The method adopted by Messrs. Ives and Scott is too intricato to describe here; we await further developments, which, we understand, are to be forthcoming soon.

In emulsion processes nothing of a fundamental nature has been done; Mr. A. L. Henderson described, lato in the year, a new and probably useful modification in gelatine emulsion-making, and earlier in the year it got noised abroad—partly owing to a mistake, we fancy—that Mr. Wellington had prepared a collodion emulsion of surpassing sensitiveness. Mr. F. Varley communicated to Mr. Meldola a process wherein extraordinary sensitiveness was said to have been obtained by the use of an iron salt alone, the said process having been wholly or partly communicated to Mr. Varley by Mr. Frieso Greene; but, on further investigation, it was discovered that, by some mistake, silver bromide had been mixed with the iron salt in the hands of Mr. Greene, and we do not pretend to be able to clear the matter up, beyond saying that undoubtedly "someone had blundered."

Probably the novelty of the year was the process of Messrs. Green, Cross, and Bevan for printing from negatives with certain coal-tar derivatives, notably primuline. While this process will probably not be largely taken up by the ordinary photographer, it is certainly a valuable addition to our list of *miscellanea*.

Transparent films are coming more and more into use, whether cut into common sizes or in "endless" rolls. The Eastman Materials Company have successfully started at Harrow their factory, wherein they make their flexible films, as well as bromide paper.

Partly, or chiefly, owing to some experiments published by Mr. Weir Brown, considerable attention has been directed to toning bromide paper after fixation, and some very useful processes for effecting this have como out. Several firms are now issuing with their paper printed instructions for obtaining warm brown tones, and Mr. Dresser and others have exhibited very good results obtained by one or other of these methods. Increased attention has also been given to gelatine chloride printing processes, the use of which—or, at least, the manufacture of paper for which—has been almost confined to the Continent. The Britannia Works Company have put on the market a paper of this kind. If much use is made of this and similar papers, it will indicate a reaction in favour of the warmer brown tones, after what promised to be their retirement before the blue tones of platinotype and bromide paper.

With the exception of some papers published by Messrs. Hurter and Driffield, nothing of great consequence has been forthcoming with regard to the theory of photography. The conclusions of these gentlemen touch so little the practical side of our work that we need do no more than mention them. The only new reagent to which any importance need be attached is paramidophenol, which has been recommended as a developing agent by those who have tried and reported on it; it seems to be full of promise, chiefly on account of its marked vigour as a reducer.

Messrs. L. Warnerke and Sutton have been occupied on certain collographic printing processes, and the latter has brought his process before the public, though some experts of the photographic press fail to find in the process any elements of real novelty. Be this as it may, Sutton's process will be one of great celerity with, probably, fair results.

We regret to have to chronicle a serious and fatal accident with gas at a lantern display at Ilkeston. It is difficult to decide where the mistake really came in, but the event has added one more fatality to our already long enough list. Soon after the Ilkeston disaster, there was a narrow escape of another in London, the faulty part this time being the gauge used on a gas-cylinder.

Among the speculations of the year has been one which ended badly for the investors—the Automatic Photographic Machine Company. Based on folly, it ended in disaster.

At present a testimonial to Dr. Maddox, the originator of the gelatine processes, is before the public, and is prospering.

Briefly, progress in 1891 has been slow but sure.

## RENOVATING THE CAMERA.*

BY H. C. STANDAGE.

*To Lay the Lacquer on Brass.*—Clean the article well from all grease, then heat moderately, lay on the lacquer with a proper brush the same as varnish, and heat again. When the lacquer is dry and firm, repeat the operation until the required colour is obtained.

*To Colour the Brass-work.*—Before lacquering, the following solutions are used. Perchloride of iron solution gives brown of all shades by simply immersing the brass article in the fluid; the colour obtained is determined by the strength of the solution. To produce violet, dip in a solution of chloride of antimony. To produce a chocolate colour, brush on the surface of brass moist red oxide of iron and potash, with a very small quantity of blacklead. An olive

* Continued from page 847.

green is produced by making the surface black by means of a solution of iron and arsenic in hydrochloric acid, and polishing with blacklead brush, and coating when warm with a lacquer composed of one part lac varnish, four of turmeric, and one of gamboge.

The following rough and ready mixture will produce lacquer suitable for common work, but for superior finish the more elaborate formulæ given should be used.

For a *Pale Lacquer*, mix:—

| | |
|---|---|
| Cape aloes | 3 parts |
| Turmeric | 1 part |
| Lac varnish | 1 ,, |

For a full *Yellow Lacquer*, use:—

| | |
|---|---|
| Turmeric | 4 parts |
| Annatto | 1 part |
| Lac varnish | 1 ,, |

For a *Gold Lacquer*, mix:—

| | |
|---|---|
| Dragon's-blood | 4 parts |
| Turmeric | 1 part |
| Lac varnish | 1 ,, |

For a *Red Lacquer*, use:—

| | |
|---|---|
| Annatto | 32 parts |
| Dragon's-blood | 8 ,, |
| Lac varnish | 1 part |

*Superior Lacquer for Brass*:—

| | |
|---|---|
| Seed lac | 1 part |
| Shellac | 1 ,, |
| Venetian turpentine | ½ ,, |
| Spirits of wine | 20 parts |

*Colourless Lacquer for Metals*:—

| | |
|---|---|
| Amber | 1 part |
| Mastic | 1 ,, |
| Sandarac | 2 parts |
| Bleached shellac | 2 ,, |
| Spirits of wine | 20 ,, |

The lacquering of brass should be done in a very warm, dry temperature, and the metal heated before applying the lacquer, and some articles require to be stoved after being lacquered.

*Renovating the Leather Bellows.*—In the first place, repair all tears, and fasten down any portion of the leather that has become detached. Good, strong, cabinet-makers' glue with a little vinegar added will secure the leather to the wood, but if required to be fastened to the metal, wash the surface of the metal over, using a hot solution of gelatine, and at the same time steep the leather in a hot infusion of nut-galls, and then place it firmly on the metal and allow to cool; it will adhere so firmly that it cannot be separated without tearing.

*Cements for Leather.*—A cement for leather of universal application is made as follows. Soak ordinary glue and isinglass for ten hours in sufficient water to cover them, then bring the mixture to the boiling point, and add pure tannin until the solution becomes sticky and has the appearance of white of egg.

*A Gutta-percha Cement for Fastening Leather to Leather* is made by dissolving gutta-percha in bisulphide of carbon to the consistency of syrup, and then dilute with petroleum. A thin layer of the cement is applied, and the pieces of leather are tightly pressed together.

*Formula for Staining Leather.*—If the leather is shabby and needs re-colouring, the following formula will meet all wants. Pour 1 quart of alcohol of 96 per cent. strength over 8 ounces of ruby shellac, close the flask hermetically, let it stand in a warm place for two or three days, shaking it every day until the shellac is dissolved; then dissolve 1 ounce of dry castile soap in ½ pint of warm alcohol of 95 per cent., add to it 1½ ounce of glycerine, shake thoroughly, and then add this mixture to the solution of shellac. To give colour to the mixture, use aniline colours. To give a beautiful black colour, dissolve 1¼ drachm of aniline black soluble in 1 gill of alcohol, add this to the other mixture, close the flask hermetically, shake thoroughly, and let the mixture stand in a warm place for fourteen days before using it.

*Formula for French Leather Lacquer.*—If the leather is not shabby enough to need re-staining, but simply re-lacquering, the following formula will effect the purpose. Boil 15 parts of logwood shavings in 120 of ordinary water, until but half the quantity remains, dissolve in this 2 parts of sugar and 12 parts of gum-arabic, and compound the mixture with solution of ferric sulphate until the previously brown-red colour of the decoction has changed into a violet-blue tint, and finally add some spirits of wine.

A second formula that gives a good black lacquer for leather is thus compounded:—

| | |
|---|---|
| Shellac | ·35 ounce |
| Turpentine | 1·75 ,, |
| Spirits of wine | 14 ounces |

·175 ounce of extract of logwood should first be dissolved in the spirits of wine, and a solution of ·035 ounce of bichromate of potash is added to this. The two last-named substances produce an intensely black colour, and the lacquer will show a glossy black colour immediately after having become dry. If a colour with a bluish tinge is desired, that object is attained in the simplest manner by dissolving ·175 to ·35 ounce of indigo carmine in the lacquer.

Another formula is composed of—

| | |
|---|---|
| Ruby shellac | 30 parts |
| Venetian turpentine | 1 part |
| Sandarac | 1 ,, |
| Castor oil | 1 ,, |
| Spirits of wine | 150 parts |
| Aniline black | 5 ,, |

If the leather has become very shabby by wear and tear, it will perhaps be best to coat it with a black lacquer in preference to a coloured one.

*Renovation of the Interior of the Camera.*—By constant use, the blackening compound on the lens tubes and body of the camera must, of necessity, become less intense than when new. Now a good dead black is a desideratum, and the following formula will supply all needs, both for the wood-work and the brass tubes.

*Formula for Ebony Lacquer for Wood-work*:—

| | |
|---|---|
| Spirits of wine | ·35 ounce |
| Aniline hydrochloride | ·35 ,, |

Apply this solution to the wood, which has been previously coated with a solution prepared from—

| | |
|---|---|
| Blue vitriol (sulphate of copper) | 1 part |
| Water | 100 parts |

This coating must have become perfectly dry before the solution of the aniline salt is applied. It is best to apply the latter with a small, soft sponge. A short time after this has been applied the wood will acquire a deep black colour. This is effected by the action of the blue vitriol upon the aniline chloride. This combination has been called nigrosine on account of its black colour, and cannot be destroyed either by acids or alkalies. The wood, therefore, can be left without further coating, but if it is desired to give it a lustre (which is not the case in the interior of a camera), a coating of cabinet-makers' varnish will be sufficient for the purpose.

*Formulæ for Blackening Brass.*—A good chemical black is produced as follows:—

A.

| | |
|---|---|
| Bichloride of platinum ... ... ... | 5 grains |
| Water ... ... ... ... ... | 1 grain |
| Silver nitrate ... ... ... ... | a trace |

Or else—

| | |
|---|---|
| Sulphate of copper ... ... ... | 2 grains |
| French verdigris ... ... ... | 1 grain |
| Sal ammoniac ... ... ... ... | 1 ,, |
| Water ... ... ... ... | $2\frac{1}{2}$ ounces |
| Vinegar ... ... ... ... ... | $2\frac{1}{2}$ ,, |

Or—

| | |
|---|---|
| Strong vinegar ... ... ... ... | 10 ounces |
| Bichloride of mercury ... ... ... | 1 grain |

Dust over with blacklead, brush off, and lacquer.

B.

To oxidise the brass, it must first have a coating of silver, and then be immersed in a solution of sulphide of potassium (liver of sulphur). As the smell is very disagreeable, the operation should be done out of doors or in a good draught. The colour depends on the degree of heat of the solution—the hotter it is, the darker will be the solution.

C.

To the clean surface of the brass apply (hot) a solution of white arsenic in hydrochloric acid. When the desired depth of colour is obtained rinse well, dry with fine sawdust, and varnish when necessary.

D.

Take about a thimbleful of lampblack, and put it on a smooth, flat stone; add four or five spots of gold size, and mix well with a palette knife, making the whole about as thick as putty. Then add twice the bulk of turpentine, mix with a camel-hair brush, and apply to the brass-work, which must previously be perfectly clean and free from grease. If more gold size be used it will become shiny.

We had intended including the turntable, camera tripod, &c., but must defer these to another paper.

## LANTERN SLIDES BY CONTACT.

BY C. HETHTON LEWIS.

Now that we are in the season for lantern slide making, I propose to mention a useful little plan for ensuring clear slides when made by contact in an ordinary printing frame behind a negative. It may have been noticed that oftentimes slides do not come out as crisp and clean as they should do, and possibly the edges may show more discolouration than the centre. I discovered the cause, in some cases, to be light reflected from the back of the printing frame, and from light getting past the glass edge of the plate during exposure, and spreading on to the sensitive film, the edges suffering in the greatest degree. To avoid this risk of light fog during the exposure, I have found a safe preventive in placing at the back of the sensitive plate a thick, soft piece of black seal plush (which can be bought at any draper's), of sufficient size to entirely cover the lantern plate, and projecting beyond the edges. The soft nature of this light-absorbing material allows the back of the printing frame to be closed, and it can then be seen that the lantern plate is practically embedded behind the negative, and that all stray light is prevented from trespassing on the otherwise exposed edges of the slide. I trust those who make use of this plan will find it an advantage.

## PHOTOGRAPHY BY ARTIFICIAL LIGHT.*

BY E. J. HUMPHERY, M.A.

The subject of the paper which I have to read to-night is that of "Photography by Artificial Light," and before commencing the subject I should like to read a short extract from a leading article in the *British Journal of Photography* of November 6th, headed "The Electric Light in Photography":—

"We have now entered the month so proverbial for its fogs, and professional photographers—who, by the way, have had anything but a happy time of it, from a business point of view, during the past twelve months—will find their trade again restricted unless some means of artificial illumination be adopted."

The editor then goes into the question of cost for electric light installation, and estimates the probable necessary expense as being between £300 and £325.

Now, this seems rather a large outlay for the ordinary professional, and suitable only for those who, like Messrs. Van der Weyde and a few others, can command very high prices for their work. For amateurs the price is prohibitive, unless their enthusiasm is equalled by the depth of their pockets, or, rather, by the length of their purses.

It is necessary, then, to seek some less costly method of lighting. Practically, the only alternative method of lighting at present adopted is the flash-light, and this has so many objectionable features that its use is very restricted. It has, amongst other defects, the following:—

1. *Imperfect combustion* of the magnesium, and consequent uncertainty in exposure.

2. *Dense masses of smoke*, which render it unfit for use in any well-furnished room.

3. *Dirt occasioned* by falling particles of imperfectly consumed magnesium dust.

4. *Heavy shadows.*

5. *Great hardness* and want of delicacy in negatives taken by this method.

The light which we require must, if possible, have none of these objections. It must be cheap, clean, free from smoke, easily measured, and capable of giving soft, diffused lighting. How far we have succeeded in overcoming these difficulties will be for you to judge after the practical demonstration which I propose to give this evening.

Many substances which give extremely actinic rays when ignited, at first sight promise very well; but after very careful and exhaustive experiments, in which I received very valuable assistance from Mr. Elder, who not only gave me the benefit of his advice and experience, but also the use of his laboratory, the conclusion which we arrived at was, that nothing which we tried gave such good results, with equal ease of working, as magnesium. You are probably all aware of the brilliant and actinic light of magnesium, but this actinism can be enormously increased if the magnesium be burnt in oxygen. Captain Abney has very kindly measured the relative actinic value of the lights, and finds that magnesium, when burnt in oxygen, has about twelve times the actinic value of the same amount of magnesium burnt in ordinary air.

We have, therefore, a light of immense actinic value, and one involving no very great outlay at starting. The lamp which we propose to use is of the simplest description, consisting of a small glass flask capable of holding about

* Paper read and demonstration given at the Camera Club on Thursday, November 12th, Captain Abney in the chair.

two litres. This is first filled with water, which is then displaced by oxygen from an ordinary pressure bottle; by this means the oxygen runs no risk of being adulterated (if I may use the expression) with air.

I will now fill the flask to illustrate my meaning. It is advisable to have a small quantity of water in the flask, for reasons which I will explain later. The only other piece of apparatus is a cover with a rod attached for holding the wire. The most convenient method is to make a small coil of the wire of the length required; to the end of this a piece of string is attached as a fuse, the string is lighted, and wire and fuse inserted into the flask. The oxygen causes the string to burst into flame, the magnesium is ignited, and a light of remarkable actinic power is the result; the actinic value of the light being far greater than its apparent brilliancy, owing to the richness of the ultra-violet rays, which are caused by the exceedingly high temperature at which the magnesium is burnt, and the consequent shortening of the wave-lengths of light.

You will observe that there is practically no smoke, none of the dense volumes which are caused by a flash-light, but what little smoke there is is kept within the bottle, and is rather advantageous than otherwise, as it helps to soften and diffuse the light.

The amount of light required is of easy adjustment. Having once arrived at the necessary amount for a correct exposure, with a definite stop and at a certain distance from the object, it is a perfectly simple matter of calculation to ascertain the requisite amount of wire to be used with a smaller stop or at a greater distance, or with plates of different rapidities.

We thus claim to have satisfied all the requirements mentioned before. viz., it is cheap, clean, free from smoke, easily measured, and capable of giving soft, diffused lighting.

For portraiture, we find that the evenness of illumination is best effected by suspending the lamp, and causing it to swing during the time that the light is burning; by this means all heavy shadows are avoided, and a perfectly evenly-lighted picture can be obtained.

The first picture to which I wish to draw your attention was taken with the lamp stationary. You will observe that there is a heavy shadow; in the other cases, where the lamp was allowed to swing, you will notice that the shadows are beautifully soft; and to show how easy it becomes to get even lighting, you will observe two sitters one on either side of a screen, both equally illuminated with a single lamp, the amount of magnesium used being about three grains, and the distance of the light from the sitters fifteen feet. This was taken in the studio, and the white blinds behind the lamp and a white cloth, which was thrown on the floor, materially assisted the lighting. The expense of this light cannot be considered exorbitant, therefore, as the cost of magnesium and oxygen combined was less than a farthing.

The swinging of the light is a very important feature, both from an artistic and economical standpoint, as not only do we get a roundness and delicacy of lighting unobtainable in any other way, but one lamp is sufficient; whereas, with ordinary flash-light, it is found necessary to have several lamps to get anything approaching a fair result.

With the flash-lamp it is impossible to get this swing, and other methods have been resorted to for obtaining similar results, the most successful, probably, being the use of movable mirrors or reflectors, by the aid of which it was attempted to get diffused lighting, but the results are in no way comparable to the effect produced by the swinging light or lamp. Many workers have used magnesium with fairly good results, both in portraiture and in interior photography, and some attempts have been made to utilise oxygen in conjunction with magnesium; but no one seems to have realised the enormous actinic value which results from the proper method of ensuring the proper combustion of magnesium in pure oxygen. How great that actinic power is I shall be able to demonstrate later on.

This method of lighting seems to hold out promise of being of very great value, not only to the professional photographer, to whom a cheap and efficient artificial light would seem to be absolutely indispensable, if we are to have many months of such gloomy and miserable weather as we have lately been experiencing, but also to the amateur, who, having no studio, is practically debarred from indulging in his favourite pastime for about six months in the year. He will now be able to enliven his winter evenings by arranging charming "at-home" pictures of his wife and daughters in their own drawing-room, and thus give us natural and pleasing pictures, free from the stiffness and constraint which seem to be almost inseparable from the studio.

On looking round these walls, one cannot help thinking how useful Mr. Robinson would have found it in securing pictures for his studies of artists at home.

To the doctor, the surgeon, and the engineer, the possibilities it holds out seem to be of the very highest importance, and as we have distinguished members of each of these professions present to-night, we shall doubtless hear their views on the subject. It is possible, also, that it may prove of great value to those who make a special study of photographing pictures, as the difficulties of getting suitable lighting for this branch of photography are often very great.

I stated earlier in my paper that no one seemed to have realised the enormous actinic value of this light, and in proof of this I would point out that no one appears to have grasped the power it gives of photographic printing. I have here a platinum print which was exposed to this light for twenty seconds only, with a consumption of two grammes of magnesium powder; the picture is fully exposed, and in certain respects is superior to any result that can be obtained from the same negative by printing in ordinary daylight.

We will now proceed to print two cabinet negatives by the aid of this light.

I have a tin of platinotype paper which has not been opened; before placing the paper in the printing frames I should like some of you to examine the paper to see that it has not been already exposed—I believe this is the usual method with other conjurors. We will now turn up the lamp and expose the frames to the light, and if some member with a stop-watch will take the time, it will be an interesting test.

You see now that the paper is fully printed, and I understand that the stop-watch gives the time of exposure as fifty-five seconds, which is certainly rather quick work compared with daylight printing.

London and Provincial Photographic Association.—December 31st, "Warm Tones in Lantern Slides"; January 7th, a paper by Mr. P. H. Newman on "Some Recent Exhibitions." Visitors are invited.

## PREPARING STRONG FERROUS OXALATE.*

BY C. W. MILLER.

The strongest form of oxalate developer, made by dissolving ferrous oxalate in potassium oxalate, is not as much used as it deserves to be, the explanation of which, no doubt, is to be found in the very considerable amount of trouble entailed in the ordinary manner of preparing it. Thus, two distinct procedures are required: first, the precipitation of the ferrous oxalate; then the solution of it in the alkaline oxalate, which operation is not very satisfactory on account of the tendency to oxalation if heat be applied for any length of time. In trying to find a more convenient plan of getting a saturated developer, I hit upon the following, which, I find answers every purpose.

By estimating the quantity of iron actually in solution in different developers, and further by the point (volumetrically, when precipitation takes place) I found that I could not in any way make a developer which should permanently contain over about 0·65 gramme of ferrous oxalate per 10 c.c. Acting on this datum, I took a saturated solution of potassium oxalate, and to it added an excess of the oxalate, which would be sufficient to convert enough ferrous sulphate to make the 0·65 gramme of ferrous oxalate. The excess of the alkaline oxalate so added was gotten into solution by heat, when the iron was added. In this manner, a developer was produced without excess of anything, except the inert potassium sulphate formed in the reaction.

In comparing a developer so obtained with the strongest form of the ordinary one (say that issued by the Eastman Company for their bromides), we find that the latter contains for every 10 c.c. 0·59 gramme ferrous sulphate, which quantity can only give 0·3 gramme of ferrous oxalate, as against at least twice that in a saturated developer.

In practice, the most convenient way to make up is to dissolve the full quantity of alkaline oxalate at once in water, so that the formula reads:—

| | |
|---|---|
| Potassium oxalate ... ... ... | 330 grammes |
| Ferrous sulphate ... ... ... | 135 ,, |
| Water ... ... ... ... | 690 c.c. |

Dissolve the oxalate by acid and heat, then cool until it just begins to be precipitated, then add the crystals of iron at once. After solution has taken place, cool completely as rapidly as possible (I place the containing vessel in cold water), and filter off into closed bottles.

In the above, we have 250 grammes of potassium oxalate which remain in solution, while the other 80·0 grammes are lost in forming the oxalate.

The quantity of water necessary to hold 250 grammes of potassium oxalates in solution is 760 c.c., but we need only take 690 c.c., since the 135 grammes of ferrous sulphate will furnish 60 c.c., the sulphate crystalising with seven molecules of water.

The oxalate of iron is slowly precipitated, after the bottles have stood some time; therefore it is better not to make up a large stock at a time. The formula is calculated to give an excess of ferrous oxatate of 0·15 grammes in each 10 c.c., most of which will remain for a short time in solution. The iron and potassium oxalate are balanced.

* Read before the Photographic Society of Philadelphia.

## PROFESSOR SYLVANUS THOMPSON ON LENSES.

This lecture—of which a report was given in a previous issue—led to the following interesting discussion:—

Mr. G. M. Whipple said he had been much gratified at hearing the reference which had been made to the work done at Kew in regard to lenses, for it ought to be better known that an attempt had been made in this country to create an optical laboratory. He was also very glad to know that the Technical Institute at Finsbury was doing similar work, and he felt sure that, with the appliances they had there, and the leisure at their disposal—not of Professor Thompson, but of the senior students—many most interesting questions in optics might be dealt with, and he hoped solved, which could not be accomplished by those who had other duties allotted to them. The measurement of lenses for microscopes had not come within the scope of their operations at Kew; their work was the examination of telescopes for the Royal navy, binoculars, gun directors—a class of telescope not much known to the general public which had been recently brought out—besides smaller glasses used in the ordinary work of navigation. Again, the sextants which were employed by cadets must bear a certificate, and this had led to increased accuracy in make. There were also certain minor instruments examined, of which he need only mention one, which required a plane surface. The grinding of a plane glass surface was a somewhat difficult operation, and it had not been much required until recently, when they had been introduced and their use rendered compulsory for cadets as artificial horizons in working their sextants. This was a matter of economy to save the waste of mercury, which was somewhat considerable when mercurial artificial horizons were employed. Plane surfaces of blackened glass were therefore introduced instead. These things had been going on for some time, but of late the Kew committee had undertaken the examination of photographic lenses, and he must add to the names of the gentlemen who had been mentioned as laying down the lines on which the work should proceed, that of Major Darwin, formerly director of the photographic department of the School of Military Engineering. He had now retired from the Royal Engineers, and had thrown himself thoroughly into this question of testing photographic lenses. He seemed to have consulted all the authorities he could get at, and had made some very ingenious and beautiful pieces of apparatus for the purpose, amongst them being a modification of Grubb's method of determining the focal length of lenses. It was much larger than Professor Thompson's apparatus, being adapted to test lenses of 6in. diameter and 30in. focal length, and was about 5ft. long and the same height. It proved very satisfactory in use. He regretted that the word "astigmatism" had remained on the prospectus and was kept in use, for it undoubtedly was wrong, but still it was a very convenient term to employ, and he did not know what could be substituted for it, and it was apparently understood by users of photographic lenses. There were other terms as regarded distortion and dispersion which were not altogether correct, and should give place to a more accurate terminology. The point with regard to focal planes, which formed such an important feature in microscopic work, had not come before them in connection with photographic lenses, nor did they use it at all in testing telescopes and binoculars.

Mr. T. R. Dallmeyer said it was very gratifying to find that at last the efforts which were being made to obtain perfection in optical work were to be subjected to critical and scientific examination, which must result in really good work being appreciated. He was particularly interested in what he understood to be a new theory in treating light, as explained in the early part of the paper, and he wished Professor Thompson had developed it further. One of the main things which opticians had to do was, after calculation, to do what he might describe as grinding a lens on paper, and this work, by ordinary processes, was very laborious. He imagined that if the process of which Professor Thompson had only given the brilliant idea were carried out with regard to the central pencils, that process of going through the mill in lens grinding would be greatly facilitated. From the one or two hints which had been given, the method seemed to be simplicity itself. There were one or two other methods of obtaining the nodal points besides those which had been mentioned. He should like to ask if, in particular constructions—one of which he was deeply interested in—one of the nodal points was only radially outside the lens, would such an application be suited to the measurement of the lens as regarded its focus? He understood that, for taking long measurements, such an instrument would be hardly applicable, but that it was chiefly confined to the measurement of lenses where the nodal points were either contained in the instrument, or were very close to it.

Mr. Conrad Beck said he also had been extremely interested in the paper, because he remembered his fearful struggles in endeavouring to work out lenses on the English system, and the delight with which he hailed the Gauss and the German system of reckoning both the signs and the principal planes. Those who had endeavoured practically to work out lenses on the ordinary system, as given in "Parkinson" and such books, would agree with him as to the enormous difficulties there were, which were entirely got rid of when the proper geometrical method of reckoning the signs, and the complete theory of the Gauss points, were brought into work. As Mr. Whipple had said, the chief importance of the nodal points was with reference to microscopic work, and in that case there were some very awkward and difficult considerations. In old days when the achromatic microscope was first introduced, it was understood that some sort of reasonable magnifying scale should be adopted, and an arbitrary scale was taken, in which the inch meant that it magnified a certain amount with a certain tube length; but nobody knew where the tube length was measured from. An American gentleman the other day published a paper in which he tabulated all the various tube lengths as measured by various English and Continental manufacturers, and they varied most enormously. But, even supposing a definite tube length to be taken, the difficulty still remained, because in order to get a magnifying power which should be in any way consistent with changed eye-pieces and object-glasses, it was necessary that low power object-glasses should be mounted in enormously long tubes, and high powers in very short tubes. When using a low power, you then had to have it a long way from the object to begin with, and that difficulty was increased by mounting it in a tube 3 inches or 4 inches long, which in the case of a 5 inch would be simply preposterous. Then, again, supposing that for the sake of scientific accuracy such a plan were adopted, what could be done in the use of a binocular microscope? With the binocular microscope it was essential to have the object-glass as near as possible to the binocular prism, whereas if lenses were mounted on the principle suggested, the low powers, which are the very powers used for binocular work, ought to be mounted a long way from the tube of the microscope. Until, however, this plan was adopted, no really true method of magnification could possibly be established. As a matter of fact, opticians at present were making their low power lenses very much higher in power than they ought to be in order to obtain this standard magnifying power which was adopted as an arbitrary scale. For instance, a modern 4-inch objective was nothing like 4 inches; it was nearer three inches, because its nodal point was too far up the microscope. It was put up to a much higher power to produce the same magnifying power in connection with the same eye-piece. This plan got over the difficulty tolerably, but when you changed the eye-piece you began to find that, although with one particular eye-piece the magnifying scale was tolerably constant—and could be made absolutely constant—when you changed the eye-piece it did not affect different powers in the proper ratio, and the scale was thrown out. Mr. Whipple said the nodal points were not of so much importance in photographic and other optical lenses, and he was quite right in saying that their position was not of nearly so much importance, but it was extremely important that some means should be adopted which eliminated the distances between the nodal points in measuring the focal length of optical instruments.

Professor Thompson, in reply, said Zeiss's way of getting over the difficulty about tube length was not quite as Mr. Beck had stated, because Zeiss distinctly attempted to regulate the depth to which the eye-pieces were to be plunged down, so that they should not overlap in the same way as in the old arbitrary scale. Whether he was successful in carrying that out with very low powers he could not say. Mr. Whipple seemed to give no hope that the practical user of lenses would be content to change the misleading term astigmatism; but what were you to do if you came across a lens which had two defects, and both were called astigmatism? If they meant different things you must give a different name to one of them and he thought you ought to give a different name to the thing which was not astigmatism. Mr. Whipple and the Kew authorities ought to invent a name, and then everybody would be obliged to adopt it.

The Chairman, in proposing a vote of thanks to Professor Thompson, said that this paper constituted a really important contribution to the knowledge of optical measurements. The instrument which had been shown and explained promised to be very useful indeed in the actual examination and specification of lenses. Hitherto, there had been no accurate method which was easily applicable for finding the constant on which the action of any lens, and still more a combination of lenses, depended. In the ordinary treatment of the properties of lenses in this country, even in scientific text-books, one got no further than dealing with lenses which were not infinitely thin, but which were dealt with as though they were; and he hoped the paper would have a great effect in widening the ordinary optical discussions, and bringing the ordinary theory more nearly into accord with actual practical experience. As yet they had hardly got beyond Newton's optics. What Gauss introduced long ago, the idea of the virtual thickness of the lens, had scarcely been recognised in all its importance in this country, though it was of the utmost value in facilitating the statement of the properties of lenses. One small point in the paper which he thought of some importance was the introduction of a term for what he believed had no name before, which was often referred to in foreign writings as the vertex, and which was here called the pole. Professor Thompson had already made important contributions to optical theory; and he would refer especially to some papers of his which appeared two years ago in the *Philosophical Magazine*, where he showed how very simply the properties of lenses could be expressed by the method he had hinted at in the beginning of this paper—by speaking of the curvature they impressed on the wave front of a beam of light passing through them. In those papers he had treated all the ordinary cases from that point of view with extreme simplicity and beauty, and he hoped this method would be adopted generally in the ordinary treatment of optics.

The vote of thanks was carried unanimously, and the meeting adjourned.

---

"The Curse of the Camera" might well form the title for a powerful article in a slashing review; for the way in which private photographs are made public, and the manner in which unsuspecting persons are mercilessly "kodaked," and then held up to ridicule, demands a vigorous protest against such social misdemeanours. A case of this kind came under my personal knowledge only the other day. Some time ago, a few of us who were staying down in the country, having nothing particular to do, devised a number of groups for a clever amateur photographer. These were in all kinds of quaint costumes and odd disguises, and photographed solely for those who took part in a harmless bit of tomfoolery. By some extraordinary chance, one of these pictures reached the other side of the Atlantic, a newspaper reporter got hold of it, and it was made the subject of a violent tirade on "the vanity of authors and artists" in an American journal. The most amusing thing about the article is that the whole thing is taken seriously, and that the people, who were so thoroughly disguised as to be unrecognisable by their friends, are written about as if they were absolute portraits. Everyone has been greatly amused at the way in which the scribe has been sold.—"The Bystander," in the *Graphic*.

## Notes.

At the end of every year a large number of subscriptions to the Photographic News expire, and we trust that those of our readers whose subscriptions thus come to an end may be induced to renew at once, so as to prevent any interruption in their reception of the paper. A twelve months' subscription for any place in the United Kingdom is now reduced to 10s. 10d. For any country in the postal union, to 13s. 0d.; and for India, China, &c., 15s. 2d. As indicated in our last number, the publication of the paper at the beginning of the new year will be transferred to Messrs. Alexander and Shepheard, 21 and 22, Furnival Street, Holborn. E.C., to whom all subscriptions can be sent and made payable, except such as belong to the present year, which must be paid, as heretofore, to Messrs. Piper and Carter, 5, Furnival Street, Holborn, E.C.

The popularity of photography is constantly brought to mind both in romance and reality. Both writers of books and playwrights are finding out how useful a photograph becomes as a means of identification, in order to compromise the hero or heroine, or in some other way to give purpose or probability to the story which he tells. Not long ago, in a play which had a short run at one of the London theatres, a detective camera was constantly *en evidence*. It is true that it was used in all sorts of impossible ways—by gaslight, for example; but these little artifices are allowable on the stage. The author probably knew no better, and the audiences—unless they were photographers—had no suspicion of his ignorance. In another play—"Gloriana"—which is now being acted, a great deal of the argument depends upon the efforts of the hero to get back a photograph which he would not care for his bride to see. And in that drama, which might be called "The Great S-pink Pearl," recently played before crowded houses at the Royal Courts of Justice, a photograph played the leading part. Photography has, indeed, much to answer for in placing in the hands of dramatists, novelists, and lawyers—whose business it is to unravel problems of human life—a new and formidable weapon.

Photography, indeed, played a very important part in what is known as the Pearl Mystery case. Both the plaintiff and the defendant—or, at least, one of them—appeared to be continually going to have their photographs taken, and it was admitted by the defendant that one of the photographs was advisedly taken to see how her jewels would "come out." Mr. Justice Denman remarked that the photograph did not give a very good idea of the now celebrated pearls, and the wearer was of the same opinion. But what else could have been expected? Unless the pearls were of the size of raspberry tarts, they would be quite insignificant in a photograph. The iridescent light emitted from a pearl would also render it a very difficult subject for the camera. No photographer has ever yet narrated his experience of photographing precious stones. It might prove interesting. In the case of a big diamond, for instance, worn in the shirt front of a millionaire, we should fancy the owner would have to sacrifice himself. To do the diamond justice, an exposure far less than that wanted for the millionaire's features would suffice. The portrait might result in representing the gentleman as a sort of ghostly negro, but he would always have the satisfaction of showing it as a proof of his self-denial so that his diamond might have fair play.

The *Scientific American* publishes this month two engravings from photographs which are more curious than pleasing. They are pictures of the Tocci Twins, in one of which the youths are seen *in puris naturalibus*, and in the other fully clothed. We write of them in the plural, because they have two heads and four arms, but they possess only one body, and one pair of legs, and as each leg is governed by a different brain, they are not able to walk. The value of a photographic picture instead of a drawing of such a subject is well seen in these pictures. We recognise them at once as the work of the camera, although there is no word to that effect, for there is a life likeness about the pictures of this curious "sport" of nature which is unmistakable.

The lecture of Dr. Gill, the well-known Cape astronomer, on "An Astronomer's Work" has been published in the *Observatory*, the concluding portion appearing in the current number. Of especial interest, as showing the services which photography has rendered to astronomy, is the curious phenomena which a photograph of the nebulæ revealed when the exposure was lengthened. Dr. Gill showed for the first time in England a photograph taken by Professor Pickering in the clear atmosphere of the Andes, of the portion of the sky including the three principal stars in the belt of Orion and $\beta$-Orianis. The lens used was of short focus, and the exposure was six hours. Parts, of course, were hopelessly over-exposed, but faint ramifications were made visible which had never before been suspected. This photograph, taken in conjunction with the photographs of the nebulæ by Mr. Roberts, leads Dr. Gill to think that the nebulæ are in a condition of stellar evolution, and confirm Laplace's theory as to the condition of the early existence and growth of the sun.

Surely the most bitter revenge disappointed love can conceive is contained in the plan adopted by a lady, the plaintiff in a recent case of breach of promise, who, incensed by the conduct of the faithless one, sent him back his photograph with the eyes carefully cut out. In the days of witchcraft, it was believed that the witch, by sticking pins into a waxen image of the bewitched person, could inflict terrible agony. Had the lady some idea of this kind, or did she desire the gentleman to infer that she would like to scratch his eyes out?

It is curious that so few women have gone into photography professionally—we mean as operators in the studio. In the old days the work undoubtedly was most exacting, and on a busy day an operator rarely had a chance of sitting down from morning to night, while the dark room operations were tedious and exhausting. Dry plates have changed all this, and there is nothing to prevent a woman embarking in the business. It is not that they have not the ability, and there is scarcely an industry once entirely absorbed by men which women have not invaded. Wood-engraving, like photography, has very few feminine votaries, and yet one has to chronicle the curious fact that the most skilled wood-engraver of drawings of machinery in the United States is a lady. The *Industry* (San Francisco) says that the engravings of machinery of this lady, published during the year by the Industrial Publishing Company, and numbering about a hundred, have never been excelled.

## LEEDS INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

By Our Special Commissioner.

[concluding notice.]

The classes devoted to portraiture are not so striking as at Glasgow, and many strong men—that is to say, strong in portraiture—who exhibited in the city over the border are not represented at all at Leeds. Messrs. Window and Grove send excellent examples of their well-known work. The best is a portrait of Ellen Terry as Lady Macbeth. Mr. Winter, of Derby, is represented by several portraits of graceful ladies treated in his well-known artistic style, but they also plainly show to the experienced eye the fault of over-elaboration of the brush-work on the prints. Of course it pays, and those who are not in the "know" pronounce them the finest portraits in the Exhibition. The photographic work is really so good that I should very much like to see more photograph and less paint. "Young Heads," by Mr. J. W. Jenkins, exhibits admirable work for an amateur. Mr. Vanderweyde's artistic group of Dorothy Dene and her sisters has received special honour, for it carries off a gold medal, and, as if this were not enough, a very perfect bromide enlargement of the same subject has obtained a silver one also. Mr. Harold Baker's work always gives me great pleasure, for its merit is due to his artistic treatment of the sitter, and the simplicity of the means he employs in the production of his best pictures. There is no theatrical straining after effect, and no over-elaboration of impossible backgrounds. I wish the same could be said of a group of two graceful ladies attired in light drapery. The quality of the photograph is everything that could be desired, but a painted doorway upsets everything. The light is supposed to be coming from it, but the light on the figures comes in a totally different direction. Mr. Warneuke has taken a silver medal for his large portraits, and he deserves it. Most of his pictures were shown at Glasgow, but as they were exhibited this year for the first time, they come within the regulations affecting prior awards.

Prince Ruffo did not quite comply with the conditions, which demand a set of four portraits. Two of his subjects could scarcely be called portraits. One was the "Holy Martyr," and the other "The Virgin and Child." The other two pictures, however, fairly might be classed under the head of portraiture, for, though scarcely portraits in the ordinary sense—for they are quite art studies—still they were taken from life, and that certainly cannot be said of the others. These two heads are so grand in light and shade, and so distinctly original in treatment, that the judges did well when they awarded them a special silver medal. We want more men like Prince Ruffo, with strong art instincts and leisure to follow them, in order to break up the conventionality which is the curse of all art, and is the particular bane of photography.

The pastoral photographs, and particularly the pictures of animals, are unusually good at Leeds. Mr. Jean Hallé and Mr. Carl Greger run each other very close for first positions, and, though the latter has carried off the higher award, perhaps stricter justice would have been done if the awards had been made equal. It may have been that there was a greater variety of subject in the two sets furnished by Mr. Carl Greger to give the balance in his favour. The "Return from Ploughing" is perhaps the best of this gentleman's work, though all are so good that it is difficult to select. Mr. Jean Hallé is represented by "Sheep Studies" only, but they are strikingly original in lighting. In one picture fan-like rays force their way through the foliage of the trees in the distance, but are so filtered by its thickness that only silver threads find their way here and there in the foreground, and touch the backs of a flock of sheep huddled together nearly in the centre of the picture. In another, the low evening sunlight comes from behind a clump of dark trees and floods the middle distance, touching, at the same time, the backs of the sheep reposing in the foreground. Mr. B. Alfièri is also very successful with his cattle studies. One certainly deserves notice. A sheep has strayed from the flock, and is drinking from a shallow pool quite in the foreground. Some tall trees cast their shadows in the water, and so bring the focus of light just where the sheep is quenching its thirst, and so fixes the attention of the beholder on the principal incident in the picture. "Against the Sea Wall" is also a striking picture by the same gentleman. A flock of sheep stand out dark against the sky, for the camera has evidently looked up at them, and monotony of outline is prevented by a horse that towers up above them, and looms out still more darkly. Mr. R. Terras has departed from silver, and at last taken to platinum. Nearly all his pictures, however, are too heavy in the background, and there is in consequence want of relief in the figures, which, after all, form the principal feature in his pictures. "His Country Cousin" knows how to manage the obedient swain, who is holding a skein of yarn. She is winding his heart-strings, as well as the worsted, round her fingers; but surely the cigarette in his mouth is out of place, for he is not smoking. Evidently the damsel thinks so, if one may judge by the expression on her face. "News of the Battle" is the best of the pictures by Mr. Terras, and his prevailing fault of blackness is absent. The pose of the young woman who kneels at the feet of the old lady is good, but the face lacks expression. The old dame is very natural, and the upraised hand conceals the face, and so there is room for the imagination. The pose of the man in the background, who evidently has broken the news to her, is natural and unaffected.

The Rev. A. H. Blake has produced two simple little pictures, called "Helping Mother," and "Good News." They are quite in the style of Mr. Gale. The incidents are simple enough. In one a little child is struggling with a big broom, whilst the mother is busy at the pump; and in the other a girl is sitting on the edge of a stone trough that catches the water from the pump, and is eagerly reading what may easily be mistaken for a love letter. Perhaps it was a real one pulled out of the pocket after all. At any rate, the expression is all right, and that is the most important point.

Mr. F. Whally has made a serious attempt in his picture, "Worn Out." A child has restlessly tossed his arms about; the father has been watching by the bedside, but has apparently dozed off, and the newspaper has dropped from his listless hands. An old book shields the light of the well-burnt candle from the eyes of the sleeping child. The rude cottage interior has been well planned, and the accessories are not obtrusive. There are a few toys on the chair by the side of the bed, and a faint light is struggling through the small casement at the back. As the light of the candle is screened from the face of the child, where does the light come from which gives delicate light and shade to the infant and his surroundings? It comes well from the front, and is high up, and there is plenty of it. No, it will not do; it is the regular studio light, for there are not usually skylights in cottages as well as casement windows. A picture so well planned should have been carried a little farther, and the proper lighting managed somehow.

Mr. Sutcliffe, in addition to several of his well-known pictures, has sent some sunset effects, in which he surpasses himself. This autumn has been a wonderful season for clouds, and he has made good use of his opportunities. "The Flag of Distress" is evidently a picture of one of the many wrecks which took place during the memorable gale a short time ago. I do not remember if the ship was lucky enough to get off again, but, apparently, she is hard aground on the shallow shore near Whitby, and, unless the next tide is merciful, she will have a short shrift.

Mr. Lyd. Sawyer has sent a number of pictures which well exhibit the versatility of his brain. Many of them are well-known subjects that have been frequently described before; but there are several in the instantaneous class that are new to me. The best is, perhaps, the one called "Towing up Stream." The murky gloom which usually distinguishes the Tyne is relieved by the silvery foam from the paddles of the tug, and the high-level bridge forms an important feature in the background.

So many of the pictures have been shown at various exhibitions, and have, therefore, been described before, and the space at my disposal in these pages is not sufficient to notice all the pictures of merit that are new to me, so I am compelled to be content to select here and there those that particularly call for remark. The lantern slides form a very large class, but I am compelled to say that the amateurs have beaten the professionals in the general quality of their work. The Leeds Society has particularly distinguished itself in this department of photography, and there is a quality about the work sent in by its members that is unusually striking.

Considerable taste has been shown by several Yorkshire firms in the arrangement of their trade exhibits. Messrs. Pearson and Denham exhibit an ingenious apparatus for the making of lantern slides. The special feature is the ease with which any part of a negative can be brought into the right position for copying. Mr. W. Middlemiss, of Bradford, has made some further improvements in the apparatus invented by Professor Barr, of Glasgow, and Professor Strand, of the Yorkshire College, for making scientific demonstration on the screen very simple. It is impossible to describe this apparatus without diagrams, however. Mr. J. D. England demonstrates the efficacy of his celluloid films by some delicate negatives exhibited with the transparencies. The manipulation is faultless, and there is not the faintest trace of halation in any of them.

In addition to the large number of works sent in for competition, there is a quantity of important pictures, marked "Not for competition," which help immensely in completing the effect of this really imposing show. The Autotype Company are large exhibitors, and the series of Academicians, by Mr. Ralph Robinson, have been lent at the request of the committee, and attract a considerable amount of attention.

In conclusion, I cannot help saying the Leeds Exhibition deserves a big financial success, for everything has been done to make it as complete as possible. The Municipal authorities were most liberal with their medals, and, in addition to nearly forty silver, and I don't remember how many bronze ones, placed four gold medals at the disposition of Messrs. England, Gale, Pringle, Cembrano, and Blanchard, who were selected to act as judges. These gentlemen evidently determined, however, not to make the awards so cheap, and only gave two out of the four gold, and twenty out of the thirty-seven silver medals, and not quite all the bronze medals. I most earnestly hope that, at the next exhibition held out of London, the classes will be given up altogether, for only by this means will the value of the awards be properly appreciated.

## PHOTOGRAPHY OF THE HEAVENS.*

BY CAMILLE FLAMMARION.

Skaenfeld's catalogue of the southern hemisphere gives the position of 133,699 stars. Mr. Gould, director of the observatory at Cordoba, Argentina, published an atlas of the southern hemisphere some years ago, but it registers those stars only that are visible to the naked eye.

These efforts represent much patient labour, but they can never hope to give what may be expected from photography. In fact, instead of meridian observations by a great number of observers, all differing one from the other in the recognition of the various magnitudes of the stars, and in methods of relating their positions; instead of innumerable transcriptions, innumerable calculations and reductions, and gathering and disseminating of the information along a long period of years—instead of this there will be undertaken an exact photograph of the heavens, and this not only of stars up to the ninth magnitude, but those of the eleventh, twelfth, thirteenth, and even fourteenth magnitudes; and these lesser magnitudes will not add difficulties further than the exposure of the sensitive plate for a longer time.

Everybody knows that stars beyond the sixth magnitude are invisible to the naked eye, and that the term "magnitude" applies simply to the apparent brilliancy of the stars, those of the first magnitude being the most brilliant, those of the second a little less brilliant, and so on, those of the sixth being the last that can be seen with the naked eye. Here is a table showing the probable number of stars of every magnitude up to the fourteenth:—

| Magnitudes. | No. of Stars. |
|---|---|
| First ... ... ... ... ... | 20 |
| Second ... ... ... ... ... | 59 |
| Third ... ... ... ... ... | 182 |
| Fourth ... ... ... ... ... | 530 |
| Fifth ... ... ... ... ... | 1,600 |
| Sixth ... ... ... ... ... | 4,800 |
| Seventh ... ... ... ... | 13,000 |
| Eighth ... ... ... ... ... | 40,000 |
| Ninth ... ... ... ... ... | 120,000 |
| Tenth ... ... ... ... ... | 380,000 |
| Eleventh ... ... ... ... | 1,000,000 |
| Twelfth ... ... ... ... | 3,000,000 |
| Thirteenth ... ... ... ... | 9,000,000 |
| Fourteenth ... ... ... ... | 27,000,000 |

The stars of the fourteenth magnitude are visible through the best astronomical instruments. It will be seen that the total of these fourteen magnitudes exceeds 40,000,000. To try to catalogue this celestial army would be not only a superhuman task, but absolutely beyond realisation; for errors would creep inevitably into such a number of observations, as well as into their reductions, their transcriptions, and their places upon a map. Years and years would not suffice, and while the work was in progress the stars themselves would change their positions in space, for each of them is animated by its own motion, more or less swift.

* Continued from page 863.

Now, photography can effect this properly and in the simplest manner, thanks to the perfection to which the art and its methods have been brought. And do you know how long it would take to perform this gigantic task, to erect this imperishable monument of astronomy? Thirteen minutes! Following are figures showing with substantial accuracy the duration of exposure necessary to get an impression of the stars of various magnitudes upon the new gelatine plates :—

| Magnitudes. | Exposure. Min. | Sec. |
|---|---|---|
| First | 0 | 0·005 |
| Second | 0 | 0·01 |
| Third | 0 | 0·03 |
| Fourth | 0 | 0·1 |
| Fifth | 0 | 0·2 |
| Sixth | 0 | 0·5 |
| Seventh | 0 | 1·3 |
| Eighth | 0 | 3·0 |
| Ninth | 0 | 8·0 |
| Tenth | 0 | 20·0 |
| Eleventh | 0 | 50·0 |
| Twelfth | 2 | 00·0 |
| Thirteenth | 5 | 00·0 |
| Fourteenth | 13 | 00·0 |

Thus, five one-thousandths of a second are sufficient exposure to photograph a star of the first magnitude, a half second's exposure takes a picture of the smallest stars visible to the naked eye, and thirteen minutes are needed to photograph those of the fourteenth magnitude. A plate 24 by 30 centimetres covers five astronomical degrees. If, at a given moment, 8,000 telescopes arranged for photography should be opened all over the earth, and turned upon 8,000 points of the sky, all the points being agreed upon in advance, the 8,000 plates would have photographed the entire heavens, and registered the 40,000,000 stars of which we spoke above. Placed side by side in their proper positions, these 8,000 plates of five degrees each would represent the 41,000 astronomical degrees of which the surface of the heavens is composed.

This kind of instantaneous photography of the heavens would be ideal, but it would not be possible, because, first, at any given moment night extends over less than half the globe; and second, because the atmosphere is never perfectly clear; and last, because these 8,000 instruments would involve an immense expense, a matter which it is simpler and more practicable to reduce to a minimum. The work will probably be divided among the following observatories in proportion to the number of plates set against each :—

| Observatories. | No. of Plates. |
|---|---|
| Paris | 1260 |
| Bordeaux | 1260 |
| Toulouse | 1080 |
| Algiers | 1260 |
| Greenwich | 1149 |
| Oxford | 1180 |
| Helsingfors | 1008 |
| Potsdam | 1232 |
| Rome | 1040 |
| Catane | 2008 |
| San Fernando | 1260 |
| Cacubaya | 1260 |
| Santiago | 1260 |
| La Plata | 1360 |
| Rio Janeiro | 1376 |
| Cape of Good Hope | 1512 |
| Sydney | 1400 |
| Melbourne | 1149 |

There will be about 22,000 plates of two degrees each, arranged so that their borders shall overlap each other sufficiently to register all the stars without fail, and thus in time cover the whole heavens. The work will probably be completed in five or six years.

Thus, nineteenth century science will bequeath to posterity an invaluable and imperishable statement as to the sidereal heavens, which in future centuries will serve as a certain basis for the solution of the great problem of the constitution of the universe.

The human eye certainly is an instrument admirably adapted to its purpose. How transparent is this living crystal, how delightful are its hues, what depth it has, what beauty! It is life, passion, light. Close the eyes, and how much of the world remains? And yet the lens of the photographer's camera is a new eye that gives the finishing touch to ours, that surpasses it, that is more marvellous still. This giant eye is endowed with four important advantages as compared with our eye: it sees more quickly, further, longer, and—inestimable faculty!—it fixes, prints, preserves what it sees. It sees more quickly. In the half-thousandth part of a second it photographs the sun, its spots, its whirlwinds, its flames, its mountains of fire, in an imperishable document. It sees further. Turned at darkest night toward any part of the heavens whatever, it discovers, in the atoms of the Infinite, stars, worlds, universe creations that our eye could never see by any possibility, no matter how powerful a telescope were brought to bear. It sees for a longer time. What we cannot contrive to see after several seconds of attention, we can never see. This new eye needs but to look sufficiently long; at the end of a half hour it will distinguish what it did not see before; at the end of an hour it will see better still, and the longer it remains directed toward the unknown, the more completely will the eye possess it, without fatigue, and always better. And it preserves upon its retinal plate all that it has seen. Our eye retains images but an instant. Suppose, for example, that you kill a man at the moment when, quietly seated in his chair, he has his eyes open and directed toward a bright window. (There is nothing improbable in the supposition upon a planet where all the citizens are soldiers, and kill each other in all manner of ways at the rate of 1,100 daily.) Then suppose that you tear out his eyes (I should have said that the hypothesis involves dealing with an enemy), and that you immerse them in a solution of alum; these eyes will then retain the image of the window, with its transverse bars and its light-spaces. But in a normal state of things our eyes do not retain images—there would be too many of them besides. The giant eye of which we speak holds fast everything it sees. Its only need is a change of the retina.

Yes, the artificial retina sees more quickly and better. And, by virtue of a property wholly lacking in the human eye, it penetrates abysses where we do not and never could see anything. This is, perhaps, its most astonishing faculty. Place the eye, for example, at the eye-piece of a telescope whose object-glass measures thirty centimetres in diameter; such an instrument is the best for practical observations. With this glass of thirty centimetres diameter and three and a-half metres in length, we may discover stars to the fourteenth magnitude, that is to say, about 40,000,000 stars of all kinds.

Now replace our eye by the photographic retina. Instantly the most brilliant stars beat upon the plate and mark their likenesses there. Five one-thousandths of a second suffice for a star of the first magnitude, one-hundredth for those of the second, three one-hundredths for those of the third, and so on, according to the proportions expressed above. In less than one second the photographic eye has seen all that we could perceive with the naked eye. But this is as nothing. Stars visible only through the telescope also come and beat upon the plate and thereon inscribe their images. Those of the seventh magnitude take a second and one-third to make their impressions on the plate, those of the eighth need three seconds, those of the ninth eight seconds, those of the eleventh fifty seconds, those of the twelfth require two minutes, those of the thirteenth five minutes, and finally, those of the fourteenth, thirteen minutes. If we have left our plate exposed for a quarter of an hour, we shall find photographed upon it all the region of the sky toward which the telescope was directed, all that this region contains, all that we could have contrived to discover with infinite difficulty by a series of very arduous and long-continued observations. But we have merely entered upon the marvellous. Let the photographic eye continue to observe in place of the human eye; it will penetrate the unknown. Stars invisible to us become visible to it. After an exposure of thirty-three minutes, stars of the fifteenth magnitude will have finished their task of impressing the chemical retina and placing there their images. The same instrument which, to the human eye, reveals stars of the fourteenth magnitude, and which would register about 40,000,000 stars in the entire heavens, discloses to the photographic eye 120,000,000, including only those of the fifteenth magnitude. It could reach forth to the sixteenth, and throw before the dazzled admiration of the observer a luminous maze of 400,000,000 stars.

Never before in all the history of mankind have we had in hand the power to penetrate so deeply into the abysses of the Infinite. Photography, with its recent improvements, takes a clear picture of every star, no matter what its distance, and sets it down in a document that can be studied at leisure. Who knows if some day, in the photographic views of Venus or Mars, some new method of analysis may not discover to us their inhabitants? And its power stretches forth to the Infinite. Behold a star of the fifteenth or sixteenth, even seventeenth magnitude, a sun like our own, separate from us by so great a distance that its light requires thousands—perhaps millions—of years to reach us, notwithstanding its unheard-of velocity of 300,000 kilometres a second; and this sun lies at such a depth that its light, so to speak, reaches us no longer. The natural eye of man never would have seen it, and the human mind never would have guessed its existence but for the implements of this modern art. And yet this feeble light, come from so far, is sufficient to make an impression upon a chemical plate which will preserve its picture unalterably. And this star might be of the eighteenth or the nineteenth magnitude, and beyond, so minute that the human eye could never see it, even aided by the most powerful telescopic appliances (for there will always be stars beyond our range of vision); and yet it will come and hurl its slight ethereal arrows on the chemical plate set up to await and receive them.

Yes, its light will have travelled during millions of years. When it started the earth did not exist, the real earth with its humanity; there was not a single thinking creature on our planet; the genesis of our world was in the process of development; perhaps only in the primordial seas that enveloped the globe before the uprising of the first continents, before the primitive, elementary organisms formed themselves upon the bosom of the waters, preparing slowly the evolutions of future ages. This photographic plate takes us back to the past history of the universe. During the ethereal flight of this ray which comes to-day to beat upon the plate, all the history of the earth has been accomplished, and in this history that of humankind is but a single wave, an instant. And during this time the history of the distant sun which photographs itself to-day has been accomplished also; perhaps it became extinct long since, perhaps it is actually out of existence.

Thus, this new eye which transports us across the Infinite enables us, at the same time, to trace the periods of past eternity. Yes, many of these far-away suns that we are taking such pains to photograph no longer exist. The end of the world has come to them as it will come to us; and the luminous couriers that they sent us before dying travel for ever. Astronomy plunges us into the insoluble mystery of the Infinite and of Eternity, and therein lies its grandeur.—*New Review.*

## INCANDESCENT GASLIGHTS.

An interesting lecture upon this subject was given last week at Westminster by Mr. Moeller, Admiral Sir E. A. Inglefield, K.C.B., presiding. The lecturer commenced his address by pointing out that in past years Dr. Auer was a pupil of Prof. Bunsen, in Heidelberg, and that, under that eminent man, he studied the earths of the rare metals.

Dr. Auer made zirconium and lanthanum his special studies, and he soon found out that the heat-resisting property of these earths was enormous, and he worked out a combination by which several of them used in a hood of cotton produced, with a small Bunsen flame, a brilliant light. It was in this form that the incandescent light was introduced into England.

When first supplying the English public with a mantle or hood, this mantle was saturated with a fluid made out of the above-mentioned rare earths in such a proportion that these mantles gave a brilliant white light for about 800 hours. One of the chemicals used at that time, however, could only be obtained in very small quantities, and in supplying lamps in England for about three months, Dr. Auer ran out completely the stock of that material. So the Company had to fall back upon a combination of rare earths which would give a perfectly good light for 200 to 300 hours, but after that time the light was only very little better than that given by an ordinary argand burner.

It has since been found that the metals required are so plentiful that any amount can be obtained. Under the auspices of the Incandescent Gaslight Company a sure advance has been made, as may be judged from the fact that from September to December last year nearly 20,000 lamps were sold. The mantles now supplied have a capacity of 25 to 28 candle power, and they would burn without much decrease in light for about 800 hours.

To-day I have to draw your attention to an invention which has been made by Dr. Auer, which will make the system one of the most economical and efficient amongst the various ways of illumination.

Dr. Auer has succeeded in finding a rare earth whose fire-resisting power is so great that no known heat is able to melt it, and this material, in connection with the mantle, produces an incandescence that is absolutely startling. To begin with, I have an ordinary Bray's burner, No. 6, and, with a pressure of one inch, this burner passes per hour 7·5 feet of gas, and, with our London gas, this would give no more than 14-candle power of light. The next burner I have here is a large argand burner. This gives at one inch pressure, with 7·5 feet of gas per hour, 26-candle power; so you see that the consumer gains already 12 candles from the same amount of gas if he uses an argand instead of a Bray's burner. A third burner is our Welsbach burner, as sold up to the present moment. This burner passes 3 feet of gas, and with this 3 feet of gas gives about 25-candle power of light, and the durability of the mantle I would average at 800 hours. Here you find already that with our lamp you get an equal amount of light as with the argand burner, with the difference that we use only 3 feet of gas where the ordinary argand burner uses nearly 8 feet.

The next lamp is our new light which we are able to introduce to the public. This burner passes 3 feet of gas, like our old Welsbach burner, and the candle power obtained on the photometer is equal to 60 candles with one inch pressure. The mantle that is on this burner will give this light for from 2,000 to 3,000 hours.

I have compared up to now our light only as regards illuminating power, and if you consider the cost of the same you will find that though, at first, the expense for putting up our lights is considerably more than, for instance, Argand or Bray's burners, or any other gas burners in the market, yet the saving of gas with our light is so enormous that the first outlay pays itself in a very short time indeed; and we have found that all those who have studied our light carefully, and who had a sufficiently large installation—all these people are in every way satisfied with the light.

The gas companies in general are dead against this light, because with it the consumption of gas is reduced to such an extent that, if the light were generally adopted to-day all over England, it would certainly mean an enormous falling-off in the revenues of the gas companies; but this fear is groundless, because the demand for light would increase, and for this reason gas companies would ultimately be the gainers.

On the other hand, there is at the present moment a very strong feeling among all those who are acquainted with its capabilities to introduce the so-called water-gas. Up to the present moment water-gas has not been successfully worked in England, on account of the various accidents which have occurred with it. But the electric light will ultimately force gas companies to supply the public at a cheaper rate, and the only way of doing this is by introducing water-gas, and if I mention to you that two-thirds of all gas used in the United States is water-gas, and that this is retailed to the consumer at from sixpence to eighteen-pence per thousand feet, giving, at the same time, just as good results as coal-gas, you will admit with me that, in a short time, this system must work its way into favour.

Bath Photographic Society.—At a meeting on the 17th inst. Mr. H. M. Smith discoursed on the kodak form of hand-camera, explaining fully the working details of the several instruments bearing that name. The utility of the kodak was illustrated by a display on the screen of a choice selection of 100 pictures which the lecturer produced by its means.

# Correspondence.

## DR. MADDOX AND DRY PLATE PHOTOGRAPHY.

Sir,—I have only this moment—Tuesday, 4 p.m.—by some unaccountable delay, received the pages of your Friday's issue, containing a further attack on me by Mr. Faulkner. As you probably go to press a day earlier on account of Christmas Day falling on Friday, I fear I may not be in time to crave a small corner in your last journal of this year; I should be sorry if I should prove to be the first to import a controversy into the first journal of the new year.

May not the animosity of which Mr. Faulkner complains as bearing on his friend, Mr. Burgess, be largely due to the language of his chief supporter?

1. Mr. Faulkner says, a "wilful wrong has been done to a deserving man." May I ask, is he not trying to do the same to another person?

2. My article of September, 1871, proves my connection with the gelatino-bromide plates.

3. Mr. Faulkner does not know the work that I had done, nor why only part was stated in my reply to Mr. Taylor's request; therefore his remarks here are futile.

4. The work was not worthless; the jurors' report is a denial of this statement.

5. I deny having the knowledge of any plot to take away any credit due to Mr. Burgess, who has tried to overshadow one who certainly was in the field before him.

6. That the jurors "were wrongly advised." Who says so? Mr. Faulkner! Let it pass.

1. Why am I said to be "the first man who experimented with gelatine associated with silver"? I suppose there was some reason for the conclusion arrived at, viz., that I had done so successfully.

2. "Why is he called the father of the gelatino-bromide dry plate?" Is it not because he was nearly two years in advance of Mr. Burgess?

3. "Why are we said to owe to him more than to any other man for the dry plate of to-day?" Because he started it in September, 1871.

4. "Why was he alone awarded a gold medal by the jurors?" I can only suggest because they saw he was entitled to receive it.

5. "Where did the negatives come from?" From where many others had proceeded—from the hands of Dr. Maddox. Who else should they come from?

Supposing these questions and suppositions have been made that I might answer them, and having very hurriedly done so, I will now ask Mr. Faulkner to be so good as to correct a statement in his previous letter which I overlooked in my former reply, that I tried to sell the process—another untruth. I omitted in my previous letter to note a remark by Mr. Burgess, who says: "If Dr. Maddox had never existed, gelatine dry plates would have been just what they are to-day." Of course, we know the value of a post-date prophet's prediction. I don't remember that any mention was made in the celebrated advertisement of Mr. Burgess using gelatine as the medium. If wrong, I shall be very pleased to be corrected.

Let me hope I have said enough, and not too much for the space at your command. With the compliments of the season, and every apology for thus trespassing so largely on your pages.

R. L. Maddox.

*Greenbank, Portswood, Southampton, December 22nd*, 1891.

Sir,—Dr. Maddox comes forward with the pretence of contradicting misstatements, but he only succeeds in contradicting himself, as I undertake to prove. He says: "It is stated that Dr. Maddox only obtained prints, and not negatives." Just so; and that statement is made on his own authority. It is from his own article of 1871, and if *it is not true*, he is responsible for it. That article and its formula, and that alone, has been the subject of discussion. There is not a syllable in it about negatives, and Dr. Maddox knows that perfectly well. It describes a worthless printing process by development.

Dr. Maddox now says he did produce negatives, and then immediately proceeds to stultify himself by explaining that they were produced by after-experiments and modifications which entirely altered the character of the formula, and which *he never published!* So that Dr. Maddox, in this letter, proves up to the hilt what I say. He gave away the worthless formula, and kept to himself the modifications which enabled him to produce negatives. If he ever did publish those experiments, let him tell us when and where.

The negatives exhibited at the Inventions Exhibition were not, and could not be, produced by his published formula, and I am prepared to demonstrate the truth of this by actual experiment before any photographic society of Great Britain. The fact is, the gentlemen forming the committee of the Maddox testimonial have been misled by statements they accepted without examination, and the attempts which have been made to burke discussion will not succeed.

Now a word about priority, the main pillar of Dr. Maddox's fame. Says the doctor: "I can truly declare that I had never known of any previous gelatine emulsion process, or I should have quoted the same." But he knows it now, and yet he sticks to it that he was the first. We cannot believe the doctor at all, with that article of 1871 staring us in the face. It is his own article, and this letter, that shows to what straits he is reduced, when he is obliged to contradict in 1891 what he wrote in 1871. He then said there was *nothing new* in what he had done. Then he must have known that the same thing had been tried before; and did not Mr. Traill Taylor say, in his editorial, that he had many times suggested substitutes for collodion? And did not Mr. Sutton speak of the proved possibility of using gelatine in emulsions? At that time Dr. Maddox was a constant reader of the journals.

Now, finally, one word about modifications and history. Mr. Pringle, and after him Dr. Maddox, appeal to history. Now the late Charles Kingsley was professor of modern history at Cambridge University, and he resigned his chair because he said he had discovered that history was a pack of lies. Now, I will not go so far as that with the history of photography, but it is not all true, and that which is not true is not history. For example, that author quoted by Dr. Maddox who said, "It did unquestionably exhibit the capabilities of gelatino-bromide," knew nothing whatever about it. He never tried it. He spoke from hearsay gossip, for if he had repeated Dr. Maddox's experiment, he would have seen that it did anything but exhibit the capabilities; it simply smothered them.

And was there ever more arrant nonsense penned by an author than the concluding part of that quotation, "for the gelatine process as given by Dr. Maddox is only *modified*, not altered, by the numerous plate and paper makers of to-day"?

How can you modify a thing without altering it? And is not all the merit or demerit in the modification? A steam engine is only a modified tea kettle; a sharp knife is only a blunt one modified; a philosopher is only a modified savage. And, if you like, the present dry plate is only Dr. Maddox's modified, but all the virtue is in the right modification.

Now, may I sum up the whole argument in a nutshell, and I will put it partly in Dr. Maddox's own words. I can truly declare that I had never known of any previous emulsion processes when I sent out my first advertisement, and if I had, they could not have assisted me, for they were all useless, for want of the modification which I had the good fortune to think of.

J. Burgess.

---

Sir,—Much has been said and much more could be said on this subject, and, knowing a few actual facts of the case, perhaps you will kindly publish the following. In the year 1873, while living at Sea View, I.W., Mr. Burgess sent me a parcel of his new gelatine plates, 9 by 7, and requested me to expose, develop, and print him a number of copies, as he wished to exhibit them that week before the Photographic Society of Great Britain. I did so, and they were exhibited, and many members should be able to testify to this, and I suppose that the Society minutes would show it. Now, sir, can Dr. Maddox or any of his friends produce anything anterior to this in the way of a "useable" gelatine plate? If not, I consider an injustice has been done to Mr. Burgess in ignoring his claim. He told me afterwards, when I asked him what reception he met with, that they laughed him to scorn when he told the members of the Society that gelatine plates would eventually oust collodion in photography. To prove this, I can produce the negative if necessary.

F. J. Matthews.

*St. John's Road Studio, Ryde, Isle of Wight, Dec. 21st.*

---

Sir,—The negatives which Dr. Maddox referred to in his last week's letter, were first introduced to the public in August, 1880—seven years after the invention of gelatino-bromide dry plates by Mr. Burgess.

At this same time Dr. Maddox makes his first claim to the honour of this invention.

I find also, that four persons simultaneously make reference to these negatives: Dr. Maddox, Mr. J. Traill Taylor (who was in America), and the then editors of *The British Journal of Photography.*

It shall suffice for the present to state that, on August 8th, 1880, these negatives were suddenly sprung on the public by *The British Journal of Photography* in the following manner:—

1. In a letter from Dr. Maddox, in replying to Mr. Burgess. "Fortunately, I happened last week to find some of my original negatives, which, through the kindness of one of the editors of this journal, Mr. Bolton, were compared with others found on the shelves of the publishing office, 2, York Street, Covent Garden, *which I had originally sent to Mr. Taylor.* I have now placed one of these negatives *(unvarnished)* on view at the establishment of the Photographic Artists' Supply Association, 43, Charterhouse Square. *It may be of interest as showing the stage at which the process left my hands.*"

2. In an editorial note at the end of the Doctor's letter: "We are pleased to be able to state that we have discovered amongst the accumulation of *curiosities* which cumber the shelves of our editorial office, *two* of Dr. Maddox's original specimens, bearing the date of Sept. 11th, 1871, *and deposited at that time with Mr. J. Traill Taylor.* These two plates prove very conclusively that the gelatino-bromide process, even at that remote period, was far from being the hopeless muddle it is alleged to have been. *The results produced in 1871 by Dr. Maddox are equal in respect of quality, density, and pluck to any gelatine work of to-day.*"

I wish to call public attention to the following most important statement.

With great diffidence, but yet distinctly and conscientiously, I affirm that Dr. Maddox could not at that time have obtained such negatives as those described. Let it be clearly understood what is here meant. At the time referred to, viz., September 11th, 1871, Dr. Maddox's work was altogether incapable of producing such results. Indeed, two years later—that is, in August, 1873—we have further evidence from the pen of Mr. J. Traill Taylor himself, which proves most conclusively that Dr. Maddox's work would not produce such results even at that later period, viz., August, 1873.

After this serious statement, it is probable that Dr. Maddox and his friends will execute a strategical movement to the rear. We shall probably be asked to belive that an excess of bromide and an alkaline developer is a modification of an excess of silver and an acid developer; that a negative emulsion is a modification of a printing emulsion. They will next ask us to believe that a racehorse is a modification of the old wooden horse with which we were acquainted in our childhood.

I would again urge experimentalists to try this wonderful experiment for themselves. They can easily make "Maddox plates" according to the Doctor's directions, which are given below. In order that these plates may have a fair chance, I propose that those willing to try the experiment should do *as I have done*, viz., give one hour's exposure in the camera, with full aperture, in a glass house on a bright day, to any still object. After this trial, it will not be surprising if the opinion be formed that the next exposure had better be one week instead of one hour.

I append to this letter the Doctor's account of his experiment, taken from the *British Journal* of September 8th, 1871, on which alone he grounds his claim. I believe this is the first time it has been reprinted since September, 1871.*

* We cannot afford space to reproduce the article referred to; and for a similar reason we are unfortunately obliged to omit a number of extracts from the same source very kindly sent to us by another correspondent.—Ed.

As far as I know, only one other journal besides the *British Journal of Photography* took any notice of the account, and that was a French photographic paper which was accustomed to take articles from the *British Journal*. If the Doctor's experiment had not been resuscitated by Mr. J. Traill Taylor in August, 1873, for certain remarkable purposes, it would probably have remained buried in oblivion. It will be observed that there is no reference in the Doctor's account to previous experiments of his own, nor to negatives; neither does it appear (judging by the concluding remarks) that he continued them, as he implies he did in his letter published last week. The Doctor will stand or fall by what he published in 1871. Surely he does not expect anyone to take seriously the marvellous compilation he made in 1887 for Jerome Harrison's history.

For the purpose of showing what had been done in the same line with a gelatine emulsion, years before the Doctor published his account, I give the following extract, which appeared in the Photographic News of November 24th, 1865:—"Your correspondent alludes to gelatine and silver held in suspension, with which and more I am fully acquainted, and have been for some considerable time, and I have brought it to a practical issue, and communicated it to the *British Journal of Photography* (Mr. J. Traill Taylor) in October last, with specimens of results, to which they advert in their issue of November 10th. . . . The prints enclosed are from the same batch of paper and solution as those sent to the *British Journal* a month since. The solution keeps well. To-day I have succeeded splendidly with opal glass, so that now I am perfect on paper and opal glass. The field open in this direction is great, *and embraces . . . . also the dry plate process for taking negatives.*"

On December 1st, 1865, the Editor of the Photographic News refers to this statement as follows:—"If Mr. Palmer has found a method of using gelatine with success, the value of his labours will consist in his success, and not in the mere idea of using gelatine, which many persons," &c.

In concluding, I appeal to the *élite* of the photographic world, and even to the ring of which Dr. Maddox was a member. I also appeal to the great body of professional photographers whose rights have been disregarded in this affair. I also appeal to the vast numbers of amateurs who have done so much for photography.

Let justice be done, and may truth prevail.

*Peckham Technical School, Dec. 21st.* J. Faulkner.

[A large amount of correspondence on the above subject is held over for want of space this week.—Ed.]

A Kansas subscriber tells us of a fellow-photographer who will not be persuaded to take a photographic journal, for the extraordinary reason that "editors make money by selling them." This same photographer, our correspondent adds, bought some "Aristo" paper, and, not knowing anything better, manipulated it in the same baths as he used for his albumen printing. He quite failed to see any improvement to be obtained with "Aristo" paper, and consequently discarded it. There is an evident connection between the "fact" and the "fancy" here.—*Wilson's Photographic Magazine.*

Imperial Russian Technical Society.—In addition to the photographic section of this in Odessa, a new society has been formed, the rules of which have received the sanction of the authorities. According to the prospectus, its aims will be: firstly, to further the theoretical and practical phases of photography and its applications, and to diffuse useful information concerning them; secondly, to encourage as much as possible a wider and more varied application of photography to scientific investigation, as being the best of all graphic processes extant; thirdly, to support and arrange amateur scientific and artistic excursions for collecting material for the study of Russia; and fourthly, to photograph ancient monuments, landmarks, noteworthy architectural buildings, &c., appertaining to the history and survey of Russia, and for the promotion of art. Judicial photography has now received official recognition in Russia, and orders have been issued to fit up a part of the fourth story, now in course of erection on the central criminal court in St. Petersburg, as a photographic laboratory and studio. It will be under the immediate superintendence of Mr. Bourinsky, whose exhibits received such eulogiums at the late exhibition.

# Proceedings of Societies.

London and Provincial Photographic Association.

*December 17th.*—Mr. G. W. Atkins in the chair.

Mr. Weir Brown showed some prints on bromide paper toned to a brighter red than had been hitherto obtainable. This was achieved by toning with uranium until all that could be converted was converted, and then removing the silver by Farmer's reducing solution—ferricyanide and hypo.

This was the monthly lantern night, and the proceedings commenced by a representative of the Incandescent Gaslight Company showing a lantern fitted with one of their "Aëro" incandescent lamps. Slides were passed through, and the illumination was judged to be more powerful than, and superior to, oil, though, for large screens, not equal to lime-light.

The usual display of slides by the members was then made, and work by Messrs. H. D. Atkinson, L. Medland (mostly of scenes in Scandinavia and Russia), J. B. B. Wellington, W. J. Rawlings, and H. M. Hastings was shown.

Mr. J. H. Taylor was elected a member.

Camera Club.

*December 17th.*—Mr. A. Stroh in the chair.

Mr. Leon Warnerke gave a description and demonstration of a simplified collographic process. He described the method of sensitising and printing the gelatine skin from which the prints by the autocopyist process are obtained, and practically demonstrated the various treatments in inking and printing, an ordinary letter copying press being employed. The effect of one of the prints taken on Whatman paper was much admired.

Richmond Camera Club.

*December 18th.*—Mr. Cembrano in the chair.

Mr. R. L. Kidd gave a demonstration of the process of "Enlarging and Printing on Bromide Paper." After describing shortly the manufacture of bromide paper, and its development (for which he recommended ferrous oxalate in preference to all other developers), Mr. Kidd, with the aid of the lantern, exposed a $3\frac{1}{4}$ inch square picture, the portrait of a child, enlarged to whole sheet size (23in. by 17in.). This was developed and fixed, and proving rather over-exposed, a second exposure was made, which resulted in a very beautiful and perfect print. The mode of printing-in clouds by double exposure was next illustrated. A snap-shot picture of Yarmouth sands having been exposed, enlarged as above, and the print partially developed and washed, a cloud negative was substituted and a further exposure made, an excellent picture being the result. Mr. Kidd then made some contact prints. Folding a piece of paper in four, he exposed each quarter of the surface in succession behind the same negative, and developed the four pictures at once—an expeditious mode of producing a number of identical prints from one negative. This concluded the demonstration, which had been accompanied throughout by a clear explanation of each process.

Mr. Whipple, of the Royal Observatory, Kew, added some remarks in recognition of the valuable services of Mr. Kidd and his firm to the cause of scientific photography, especially as applied to the recording of meteorological observations.

Brixton and Clapham Camera Club.

On the 17th inst., a demonstration was given by Mr. J. Howson, of the Britannia Works Company, upon the new Ilford gelatino-chloride printing-out paper and the special black tone lantern plates. He toned several pieces of paper, and developed four lantern plates, showing with what great ease the various operations could be performed, and the latitude there is in exposure. This was demonstrated by exposing three lantern plates for 25, 50, and 75 seconds respectively at 18 inches from a gas burner, and one to the light of an ordinary wax match at a distance of 6 inches. These were all developed at once in the same developer, and little or no difference could be discerned in the resulting slides.

Messrs. Nye, Dockree, Berry, Willoughby, Wright, and Dr. Wylie were elected members.

The Vice-President read a letter from Mr. Andrew Pringle with reference to the Maddox Testimonial Fund, and it was decided to start a subscription list, to which several amounts were contributed.

---

Bristol and West of England Photographic Association.
At the meeting on December 16th, Mr. Smith, of the Eastman Company, delivered a lecture and gave a demonstration of the "Kodak" hand-cameras, showing the latest folding type, with removable roll-holder for using a focussing screen, and in which the shutter has a working range of 5 seconds to $\frac{1}{200}$ second as well as time exposures. A large number of slides was then passed through the lantern.

In reply to a question, Mr. Smith advocated developing a number of films face downwards, to avoid puckering during development.

The tone of the slides being much admired, Mr. Smith said they were collodio-bromide emulsion, made by Mr. Wm. Brookes, of Reigate.

---

Lantern Society.

*December 14th.*—Mr. E. M. Nelson read a paper on "Condensers for the Optical Lantern." He said that a question often asked was, what is the focus of a condenser? It was a difficult one to answer, because there was the equivalent focus, and the equivalent back focus, the actual focus, and the actual back focus. It was therefore necessary, in the first place, to understand which of these four foci was meant. He then explained by means of diagrams how, with only simple arithmetic, the position of these four foci might be calculated with sufficient accuracy for all practical purposes. He next spoke of the importance of reducing the spherical aberration, which, necessarily, was very great in the bending of the marginal rays through such a large angle, to a minimum, and he explained that spherical aberration and unevenness of illumination were correlative terms. The greater the bending of the rays, the greater will be the aberration, and the more lenses that this is accomplished with, the less will be the aberration. A quadruple condenser has less aberration than a triple, and a triple than a double. Freedom from spherical aberration means greater concentration of light, as well as greater evenness of illumination; it is, therefore, desirable to obtain it on every account. He next touched upon the illuminating powers of condensers, and said that the question for lanternists was not so much the total amount of light that was condensed, but the amount per unit of area; and he showed that if a slight increase was made in the diameter of a condenser, it was necessary to make a large increase in the angle, so that the same amount of illumination per unit of area might be maintained. In conclusion, he pointed out that achromatism in converging lenses by distancing them was impossible.

On the conclusion of the paper, the following five condensers were practically tried in a lantern made especially for the purpose: a flint quadruple, two crown triples, a crown double, and the ordinary commercial double. The five condensers were held in a slide, and could be pushed alternately into position without needing any alteration of the other adjustments. The general opinion was that the flint quadruple gave the best definition, but that the crown double gave the strongest and purest illumination.

---

Society of Amateur Photographers of New York.
The following awards, consisting of handsome bronze medals, have been made at the exhibition of the Society of Amateur Photographers of New York, held at the American Institute Fair. The judges were Messrs. Wm. Kurtz, Frank La Marma, and Henry A. Ferguson, a professional and an amateur photographer, and an artist.

*Landscape*:—Superiority—H. M. Grisdale; excellence—Alfred Stieglitz; merit—Hugo S. Mack.

*Marines*:—Superiority—Charles Wager Hull; excellence—Ferdinand Ruppert.

*Portraits*:—Superiority—Charles H. Davis.

*Instantaneous*:—Merit—G. W. Wundrum.

*Enlargements*:—Superiority—L. H. Laudy; excellence—Louis T. Brush; merit—J. S. Couverse.

*Genre*:—Superiority—Miss Emilie V. Clarkson.

*Interiors*:—Excellence—Fred Vilmar.

The judges also recommend for honourable mention examples of different methods of sensitising and toning upon various papers—Edward Leaming and A. L. Simpson.

*Cloud Effects*:—Charles Wager Hull, to whom also a Hetherington magazine camera was awarded by popular vote.

---

## Answers to Correspondents.

A. W. D. (South Australia).—We think it best to answer your letter by communicating, as you suggest, with your agents here, and we will tell them where to purchase the books and goods which you require. We were much interested in reading the pamphlet enclosed in your letter.

Midas.—The swelled gelatine process, by which is understood the expansion in water of a bichromated film after exposure to light, is perfectly open to everybody. There is also no bar to your obtaining from such a film a mould in plaster, wax, or other material. You are also free to electrotype from such a film. These operations were patented long ago, but, as the patentee only obtained provisional protection, it is obvious that the method is now open to anyone who cares to practise it.

F. O.—We do not contemplate starting a "Sale and Exchange Column." If you refer to our advertisement pages, you will find those who deal with second-hand apparatus.

Instanto.—You say that you cannot understand why the photograph of an express train travelling at sixty miles per hour does not show movement, although the shutter worked at the $\frac{1}{120}$th of a second. If you examine the picture carefully, you will find that it does show movement in a slight blurring of the outline of the vehicles. If you care to make the calculation, you will find that in the fraction of a second indicated, an object moving at the rate of sixty miles per hour would advance about six inches. This is hardly perceptible in a quarter-plate photograph, but, as we have already said, is noticeable on careful examination.

P. G.—Before buying one of the pressure gauges named, you would do well to see Suter's new form of gauge, which works upon another principle altogether, and is said to be accurate as well as perfectly safe. We believe that most dealers stock it.

Basalt.—The pictures are curious and interesting, and you will do well by sending copies to Mr O. W. Jeffs, who is the Secretary of the Committee appointed by the British Association to collect, preserve, and register photographs of geological interest which have been taken in the British Isles. His address is 12, Queen's Road, Rock Ferry, Cheshire.

Opus. K.—In our next. Thank you.

J. P.—We have re-directed the letter, and sent it on to the gentleman named in your note.

---

A Russian Year-Book of Photography, we learn, will be published in April next.

An opening is being afforded to young ladies wanting employment in the spectro-photographic departments of observatories. It is found that they are gifted with keener visual power in regard to minute objects than men, and that they are more conscientious about small things. Miss D. Clumpe, who has just furnished an interesting paper on twin or double stars in the *Bulletin Astronomique*, is attached to the Paris Observatory, where M. Bouquet de la Grye has formed a staff of young ladies for the examination of the photographs of the transit of Venus. Although the comic journals are finding matter for squibs in this new departure in astronomy, it is quite a serious one.—*Daily News.*